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AFGL-TR-78-0248

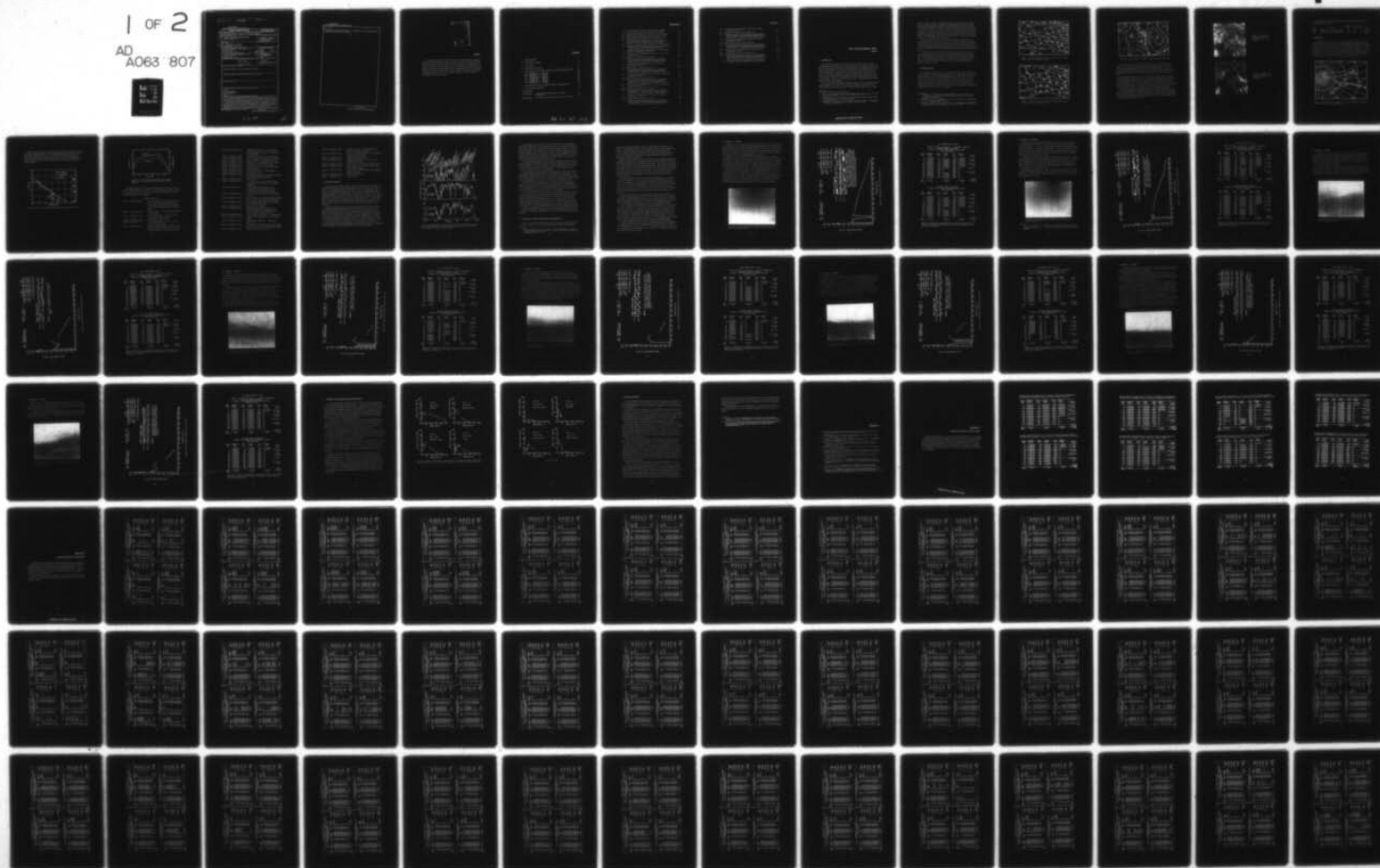
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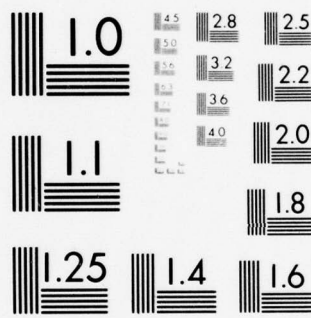
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MICROCOPY RESOLUTION TEST CHART  
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photographs of clouds and with plots of resulting particle concentrations and calculations of liquid water content.

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## Preface

We greatly appreciate the assistance that the AFGL technicians and engineers, MSgt Tom Moraski, MSgt Steve Crist, and Anthony Matthews provided the Mission Director (DMB) in acquiring the data discussed in this report. Our thanks are also extended to Michael Francis and Daniel Leach of Digital Programming Services, Inc. for their aid in computer processing the aircraft sampling data; to Anthony Matthews and Barbara Main for assistance in processing auxiliary information; to Pat Sheehy for typing the manuscript; and to Dr. Arnold A. Barnes, Jr. and Dr. Robert M. Cunningham for reviewing the paper.

## Contents

1.	INTRODUCTION	9
2.	SYNOPTIC SITUATION	10
3.	THE FLIGHT	14
4.	DISCUSSION OF RESULTS	18
5.	EXAMPLES OF 15-SECOND AVERAGE PARTICLE DISTRIBUTIONS	20
5.1	Example No. 1: 1823:51Z	22
5.2	Example No. 2: 1825:30Z	25
5.3	Example No. 3: 1838:14Z	28
5.4	Example No. 4: 1842:07Z	31
5.5	Example No. 5: 1907:39Z	34
5.6	Example No. 6: 1908:46Z	37
5.7	Example No. 7: 1916:56Z	40
5.8	Example No. 8: 1924:04Z	43
6.	EXAMPLES OF LONGER PERIOD PARTICLE DISTRIBUTIONS	46
7.	CONCLUDING COMMENTS	49
	REFERENCES	51
APPENDIX A:	Average Particle Distributions for Varying Time Periods	53
APPENDIX B:	Average Particle Distributions for 30-Second Periods	59

## Illustrations

1.	The 500-mb Synoptic Chart 27 February 1978 at 0000Z	11
2.	The 300-mb Synoptic Chart 27 February 1978 at 0000Z	11
3a.	Surface Synoptic Weather Chart 26 February 1978 at 1800Z	12
3b.	Western GOES Visible Picture 1815Z, 26 February 1978	13
3c.	Western GOES IR Picture at 1845Z, 26 February 1978	13
4.	Track and Times of Sampling Aircraft on 26 February 1978 Based on Distance and Direction From Albuquerque	14
5a.	Portion of Albuquerque 1200Z Sounding on 26 February 1978	15
5b.	Variation of Aircraft Altitude and Outside Air Temperature as a Function of Time During the Sampling Mission	16
6.	Variation of Liquid Water Content With Time as Determined by Three PMS Spectrometer Probes	19
7a.	Selected 16-mm Frame 1823:51Z, Base of Cs 5.9 km MSL, Temperature -19.8°C	22
7b.	Spectrometer Particle Data for Figure 7a	23
7c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 7b and the Photo in Figure 7a	24
8a.	Selected 16-mm Frame 1825:30Z, In Cs 6.2 km MSL, Temperature -22.3°C	25
8b.	Spectrometer Particle Data for Figure 8a	26
8c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 8b and the Photo in Figure 8a	27
9a.	Selected 16-mm Frame 1838:14Z, Near Cs tops 7.6 km MSL, Temperature -29.9°C	28
9b.	Spectrometer Particle Data for Figure 9a	29
9c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Lower One Corresponds to the Plotted Values on Figure 9b and the Photo in Figure 9a	30
10a.	Selected 16-mm Frame 1842:07Z, Very Thin Cs 8.5 km MSL, Temperature -30.3°C	31
10b.	Spectrometer Particle Data for Figure 10a	32
10c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 10b and the Photo in Figure 10a	33
11a.	Selected 16-mm Frame 1907:39, Thin Ci 8.5 km MSL, Temperature -33.5°C	34
11b.	Spectrometer Particle Data for Figure 11a	35
11c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 11b and the Photo in Figure 11a	36



## Illustrations

12a.	Selected 16-mm Frame 1908:46, Thin Ci 8.5 km MSL, Temperature -33.5°C	37
12b.	Spectrometer Particle Data for Figure 12a	38
12c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 12b and the Photo in Figure 12a	39
13a.	Selected 16-mm Frame 1916:56, Thin Ci 8.8 km MSL, Temperature -35.5°C	40
13b.	Spectrometer Particle Data for Figure 13a	41
13c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 13b and the Photo in Figure 13a	42
14a.	Selected 16-mm Frame 1924:04, Thin Ci 8.8 km MSL, Temperature -36.1°C	43
14b.	Spectrometer Particle Data for Figure 14a	44
14c.	Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 14b and the Photo in Figure 14a	45
15.	Particle Concentration as Function of Size for Different Cirriform Cloud Types Samples on 26 February 1978	47

## Cirrus Particle Distribution Study Part 2

### 1. INTRODUCTION

The AFGL instrumented MC-130E was flown 26 February 1978 on a cirrus sampling flight in the Albuquerque, New Mexico local area to obtain particle data for the Air Force Weapons Laboratory's Advanced Radiation Technology program. The purpose of this flight and of the similar 29 October 1977 flight was to acquire additional information on the typical type and concentration of ice particles in cirrus clouds. For further background information concerning cirrus data in general and the type of data available from this particular aircraft's instrumentation the reader is encouraged to review Part 1 of this study by Varley.<sup>1</sup> Ensuing parts will provide data from other sampling flights.

In a previous paper Knollenberg<sup>2</sup> reported cirrus clouds to be composed largely of bullet particles and columns. Heymsfield<sup>3</sup> found plates, columns, and some bullet rosettes in weak uniform cirrus, but mostly bullet rosettes in heavy uniform

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(Received for publication 10 October 1978)

1. Varley, D. J. (1978) Cirrus Particle Distribution Study, Part I, AFSG, No. 394, AFGL-TR-78-0192.
2. Knollenberg, R. G. (1973) Cirrus-contrail cloud spectra studies with the Sabreliner, Atmos. Tech. (by NCAR), No. 1; 52-55
3. Heymsfield, A. (1974) Ice crystal growth in deep cirrus systems. In Preprints of Conf. on Cloud Physics, Amer. Meteor. Soc. pp 311-316.

cirrus. In cirrus uncinus Heymsfield<sup>4</sup> detected bullet rosettes, single bullets, banded columns, and plates. Heymsfield and Knollenberg<sup>5</sup> collected ice crystals in different cirrus generating cells and found concentrations of crystals larger than  $15 \mu m$  to be  $1 \times 10^4$  to  $2.5 \times 10^4 m^{-3}$ , and the water content to be from 0.106 to  $0.26 g m^{-3}$  in cirrostratus, and 0.15 to  $0.39 g m^{-3}$  in cirrus uncinus. They pointed out that these values were relatively large in comparison to other cirrus data, but that the cirrus generating cell, which they concentrated on, was somewhat different in that it was a mass of growing ice crystals.

Some 14 case studies of cirrus clouds were described by Hobbs et al<sup>6</sup> who acquired airborne data with a B-23 aircraft. They found low number concentrations of ice particles are usually associated with low ice mass concentrations and high number concentrations with high mass concentrations. They also reported that total ice mass concentration in cirrus clouds generally increases with increasing temperature.

An effort was made in our 26 February flight to collect particle data near the bases and within and near the tops of cirrus and cirrostratus clouds associated with an approaching upper level trough. No thunderstorms were in the sampling area. All PMS particle spectrometers were operative and obtained useful data. However, the formvar particle replicating device and dewpoint equipment were defective and were not used.

## 2. SYNOPTIC SITUATION

The upper level flow across the United States was nearly zonal on 26 February with a weak upper level trough along the West Coast, a minor ridge just east of the Rocky Mountains, and a strong west-northwesterly flow from there to the East Coast. No jet stream was in the Albuquerque area, however. Figures 1 and 2 depict the general flow at 500 and 300 mb. As shown in Figure 3a there was a strong high pressure cell (1032 mb) at the surface in the Central Plains area, a diffuse low pressure area in the western states, and a weak stationary front through the Western Plains along the lee of the Rockies.

4. Heymsfield, A. (1975) Cirrus uncinus generating cells and the evolution of cirriform cloud. Part I: Aircraft observations of the growth of ice phase. J. Atmos. Sci. 32:799-808.
5. Heymsfield, A., and Knollenberg, R.G. (1972) Properties of cirrus generating cells, J. Atmos. Sci. 29:1358-1366.
6. Hobbs, P.V., Radke, L.F., and Atkinson, D.G. (1975) Airborne Measurements and Observations in Cirrus Clouds, AFCRL-TR-75-0249.



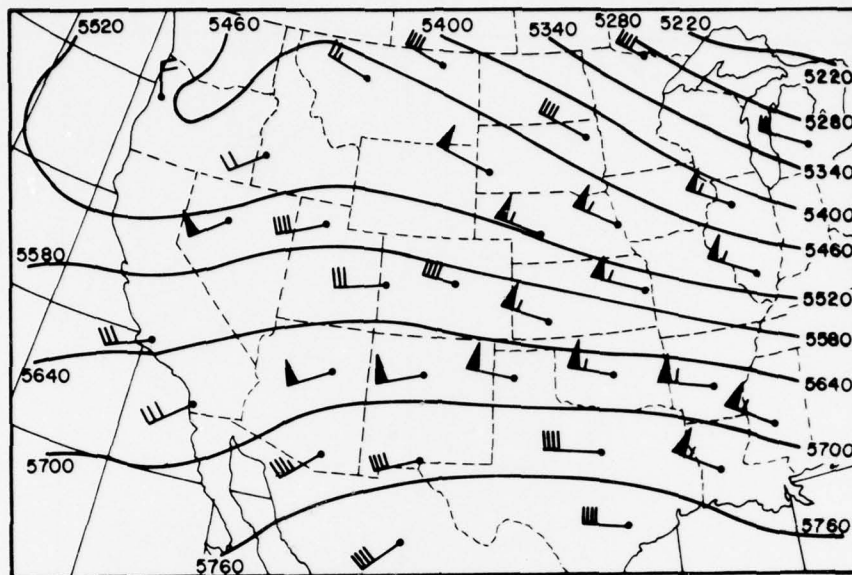


Figure 1. The 500-mb Synoptic Chart 27 February 1978 at 0000Z.  
Heights indicated in geopotential meters

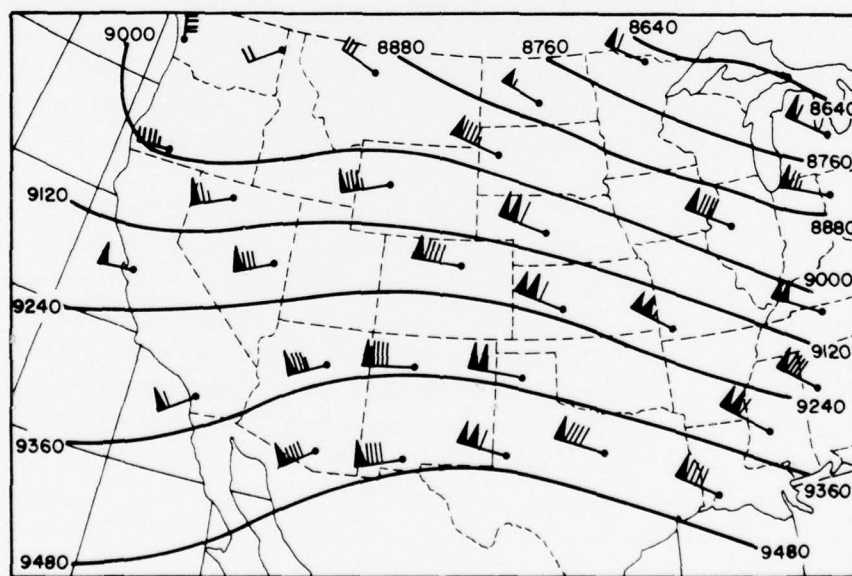


Figure 2. The 300-mb Synoptic Chart 27 February 1978 at 0000Z.  
Heights indicated in geopotential meters

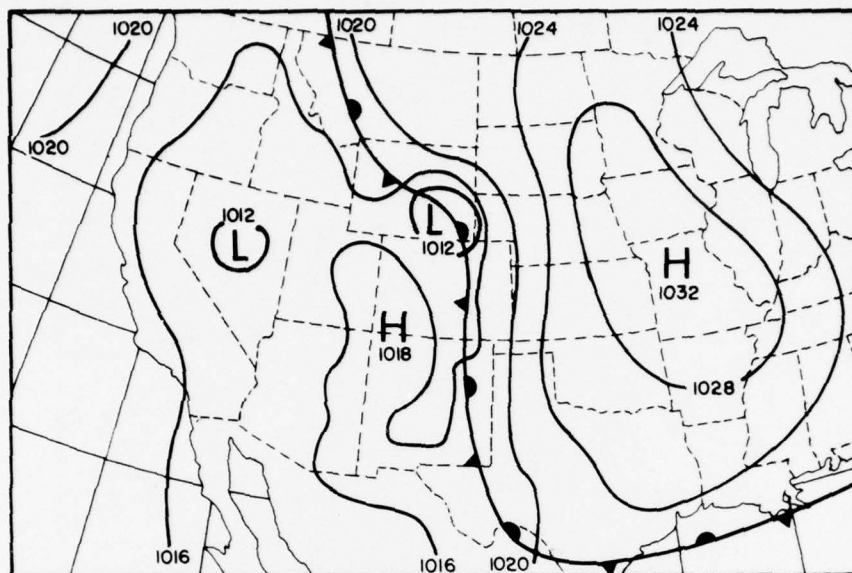


Figure 3a. Surface Synoptic Weather Chart 26 February 1978 at 1800Z

Figures 3b and 3c are visible and infrared pictures from the western GOES satellite. They show that the area east of the Rocky Mountains in Colorado and New Mexico had considerably less clouds than on the western side of that range. The lighter shading south and southwest of Utah, Colorado, and New Mexico in the infrared picture reflects the higher, colder clouds that were being advected to the east.

The cirrostratus and cirrus clouds sampled on 26 February were over south central New Mexico. They consisted of a rather deep cirrostratus layer with bases between 16,000 and 18,000 ft (4.9 - 5.5 km) and a cirrus layer based at approximately 27,000 ft (8.1 km). The cirrostratus was nearly overcast over much of the area, but varied from very thin to dense with striations. Above 29,000 ft the atmosphere was nearly cloud-free except for a few contrails of temporary nature.

Surface estimates of the cloud bases over most of Arizona, New Mexico, and Western Texas ranged from 10,000 to 25,000 ft (3.0 - 7.6 km) with little geographic trend. No weather radar echoes were reported over this large area and there were no reports of precipitation. Surface temperatures over most of New Mexico ranged from the upper 40's to lower 60's (°F).

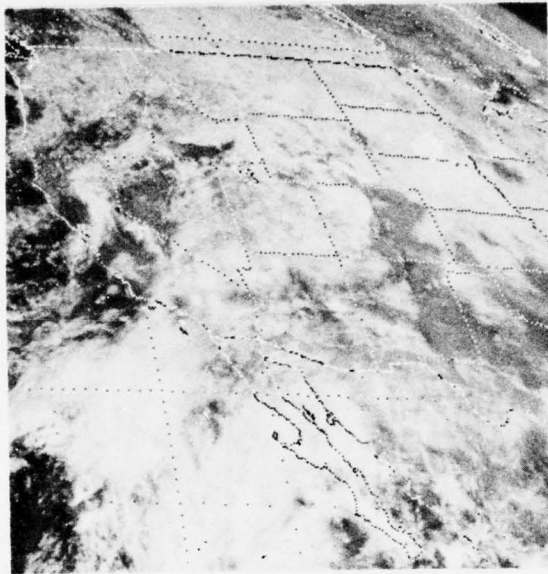


Figure 3b. Western GOES  
Visible Picture 1815Z,  
26 February 1978. 2-mile  
resolution

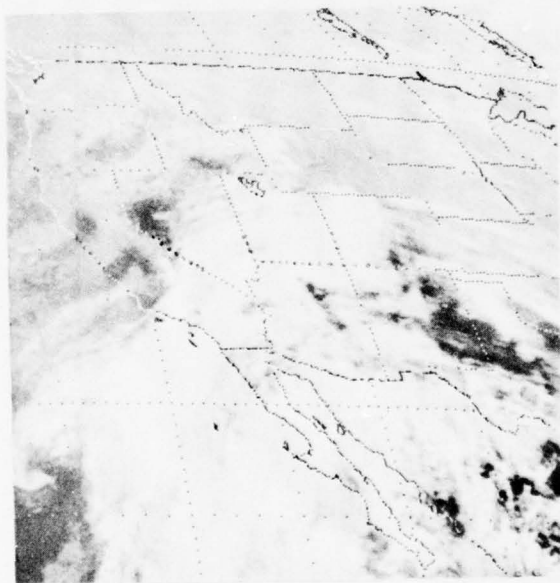


Figure 3c. Western GOES  
IR Picture at 1845Z,  
26 February 1978. 2-mile  
resolution

During the time that sampling was being conducted, Albuquerque reported the following weather conditions.

Time	Clouds	Visibility (mi)	Temp (°F)	DP (°F)	Winds
1800Z	14,000 ft Sctd, Est 25,000 ft Brkn	60	57	19	190/10
1900Z	14,000 ft Sctd, Est 25,000 ft Brkn	60	59	19	210/90

### 3. THE FLIGHT

The sampling aircraft departed Kirtland AFB near Albuquerque at 1810 GMT (1110L) and flew generally in the area near Albuquerque that is indicated in Figure 4. The cirrostratus and cirrus clouds that were flown through, extended from 18,000 to 29,000 ft (5.5 - 8.8 km) during ascent and from 29,000 to 16,000 ft (8.8 - 4.9 km) on descent. An effort was made to record particle spectra throughout the clouds, but particularly in the thinnest portions near their bases and tops. The density of the clouds varied from dense in some areas to very thin and from uniform milky cirrostratus in the cloud interior to striated, wispy cirrus on top.

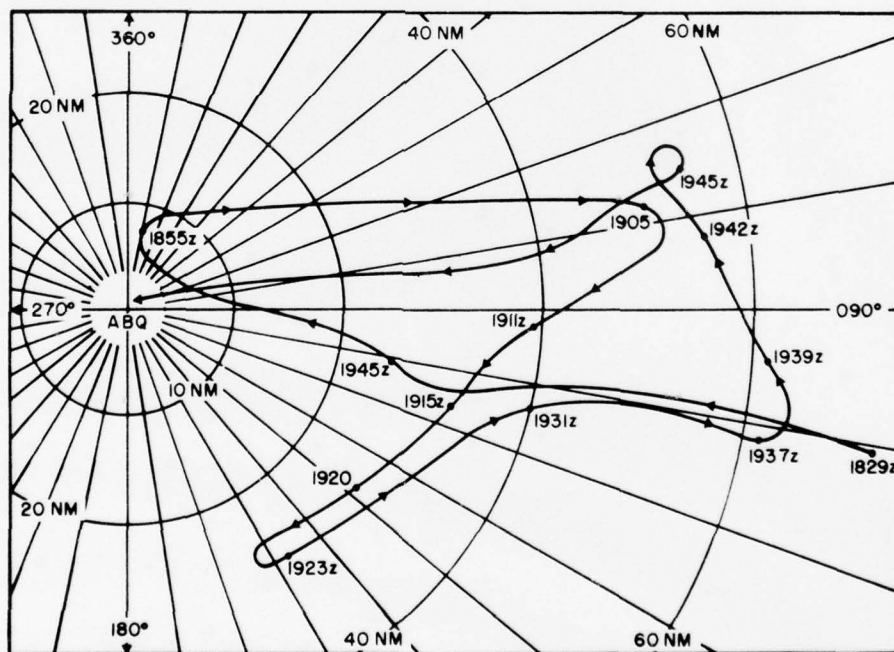


Figure 4. Track and Times of Sampling Aircraft on 26 February 1978 Based on Distance and Direction From Albuquerque

Figure 5a shows a portion of the Albuquerque temperature sounding a few hours before the sampling took place. The small temperature-dewpoint spread from approximately 6 through 9 km (19,700 - 29,500 ft) MSL reflects the presence of cirriform clouds that were later flown through. The plots of aircraft altitude and outside air temperature are shown on Figure 5b for the portion of the flight at cirrus altitudes.

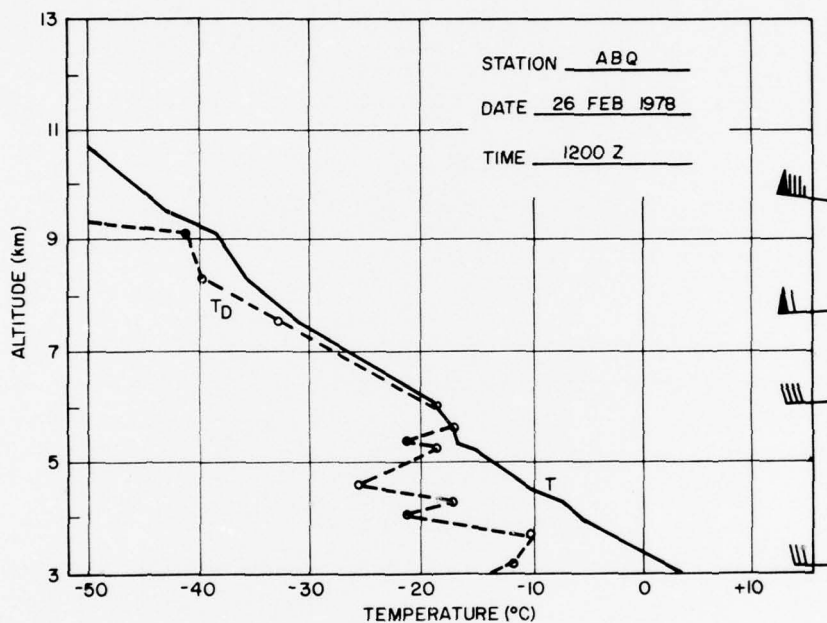


Figure 5a. Portion of Albuquerque 1200Z Sounding on 26 February 1978



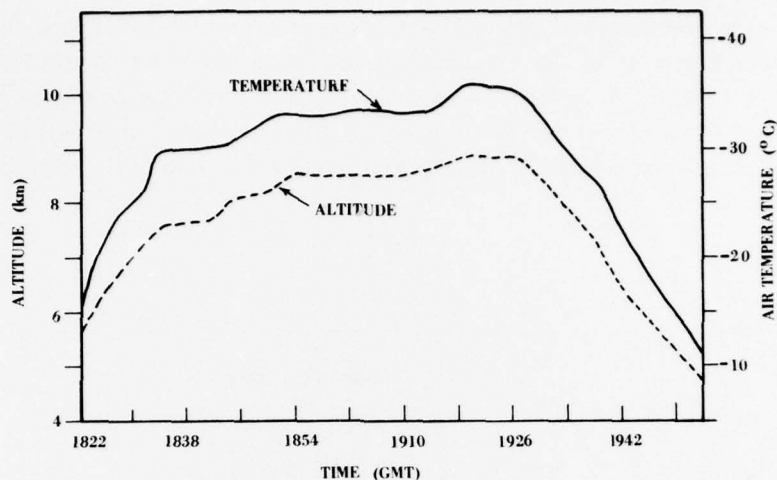


Figure 5b. Variation of Aircraft Altitude and Outside Air Temperature as a Function of Time During the Sampling Mission

The following notes are from the mission director's log or from a review of the nose camera movie film. All times are universal (GMT). Altitudes are from an altimeter set at 29.92 in. of mercury. (More accurate altitudes are given on the printout listings in the appendixes.)

#### Mission Directors Log

1819:35 - 15,000 ft (4.6 km).	Sun moderately to strongly visible through all areas of cloud. One tenth coverage of altostratus (As) and altocumulus (Ac) with bases at 15,000 ft, tops 15,800 ft. No clouds below these.
1822:35 - 18,000 ft (5.5 km).	Base of Cs layer. 2-D probe indicates presence of ice crystals.
1826:11 - 20,800 ft (6.3 km).	In Cs since 18,000 ft. Sun strongly visible. Very faint 22° halo visible above.
1827:24 - 21,500 ft (6.6 km).	Ground faintly visible below.
1828:04 - 21,800 ft (6.7 km).	Halo no longer visible. Still in Cs, with no breaks since initial entry.
1830:59 - 23,100 ft (7.0 km).	Ground still faintly visible. No breaks yet in Cs. Within about 2000 ft of tops. Blue sky visible through Cs above. More Cs below than above.

1833:50 - 24,200 ft (7.4 km).	Striations in Cs above us. Crystal habit is bullet rosette and irregular ice. Some plates also identifiable.
1834:50 - 24,700 ft (7.5 km).	Near top of Cs layer. Cs is very thin here.
1836:27 - 25,000 ft (7.6 km).	Ground no longer visible. Cs is very uniform.
1840:59 - 25,000 ft (7.6 km).	Into area of thin Cs. Just below tops of Cs.
1843:30 - 25,800 ft (7.9 km).	In tops of Cs. Ci bases above us about 1000 ft.
1845:00 - 26,400 ft (8.0 km).	Between Cs layer below and Ci above.
1850:30 - 27,200 ft (8.3 km).	Cs below and Ci above seem to merge ahead.
1851:07 - 27,500 ft (8.4 km).	Entering Ci bases.
1853:50 - 28,000 ft (8.5 km).	In very thin tenuous Ci. Bullet rosettes.
1858:30 - 28,000 ft (8.5 km).	Moderately dense Cs.
1901:00 - 28,000 ft (8.5 km).	In Cs with bullet rosettes. Sun brightly visible. Approximately 1000 ft below tops.
1904:00 - 28,000 ft (8.5 km).	Near tops of Ci.
1908:07 - 28,000 ft (8.5 km).	Very thin Ci here. Can see ground clearly through milky thin Cs below. Tops estimated at 29,000 ft.
1911:28 - 28,100 ft (8.5 km).	In thin Ci with clearly defined 22° halo. Visibility estimated at more than 5 miles. Ground clearly visible through Ci below.
1915:00 - 28,400 ft (8.6 km).	Very near top of Ci. Blue sky visible through Ci above.
1916:05 - 29,000 ft (8.8 km).	On top of most of Ci. Only some distant contrails above. Tops of Ci undulate around 29,000 ft.
1917:39 - 29,000 ft (8.8 km).	Passed through dense Ci then came out rapidly to less dense and then clear.
1919:57 - 29,000 ft (8.8 km).	Still in and out of Ci tops.
1927:00 - 29,000 ft (8.8 km).	Begin gradual descent through Ci and Cs. Skimming through tops of moderately dense cloud. Occasional hints of blue above.
1929:20 - 28,300 ft (8.6 km).	In very uniform, milky thin Ci. Just below tops.
1930:42 - 27,900 ft (8.5 km).	Unable to see through to ground. Sun brightly visible.
1931:24 - 27,500 ft (8.4 km).	Ground faintly visible below. Still in thin uniform Ci.
1933:17 - 26,500 ft (8.1 km).	At level of a break between Ci above and Cs below. A 22° halo in Ci above. Sun still brightly visible.
1936:00 - 25,800 ft (7.9 km).	Entering Cs layer on way down.

1939:48 - 23,500 ft (7.2 km).	In uniform, thin Cs. Visibility estimated at 15 miles. Descending to Cs base.
1941:12 - 22,300 ft (6.8 km).	In Cs. Clouds thin and tenuous. Sun moderately visible through clouds above.
1942:12 - 21,500 ft (6.6 km).	Back into more dense cloud.
1944:54 - 20,200 ft (6.2 km).	Emerged from dense cloud. Now very thin. Ground clearly visible.
1947:25 - 19,000 ft (5.8 km).	Dense cloud. Can no longer see blue sky above.
1948:49 - 18,300 ft (5.6 km).	Ground visible again. Cloud structure uniform. Sun moderately visible.
1950:20 - 17,700 ft (5.4 km).	Near Cs bases. Light intensity, large aggregate particles and plates.
1952:30 - 16,600 ft (5.1 km).	Below bases in clear air.
1953:07 - 16,100 ft (4.9 km).	Below all clouds.

#### 4. DISCUSSION OF RESULTS

Figure 6 is a record of the variation of liquid-water-content (LWC) during the flight as determined by the PMS (Particle Measuring Systems, Inc.) scattering, 1-D cloud and 1-D precipitation spectrometer probes. When recording bullet rosette particles or combination of bullets, as was done in most of this flight, these probes measure particles in ranges extending from approximately 2 to 30  $\mu$ m, 26 to 311  $\mu$ m, and 400 to 4676  $\mu$ m, respectively. These are central values of the lower and upper channels of each probe so the range is actually slightly greater. For example, the 400  $\mu$ m channel records particles from approximately 250 to 550  $\mu$ m in size. The plots of values in Figure 6 are based on data averaged over consecutive 15-sec intervals.

The notes at the top of Figure 6 are based on transcribed comments from the aircraft mission director's log and from a review of the 16-mm movie film from the camera in the nose of the aircraft. In general, there was good correlation between the reported frequency and density of clouds flown through and the variation of liquid water content (LWC) as determined by the precipitation probe. That is, when the mission director indicated the aircraft was in a dense cloud or in no cloud the precipitation probe LWC usually showed high or low values, respectively. This is, of course, comparable to saying there was a high number or low number of precipitation probe-sized particles present. There was less evidence of a correlation between visibility and the smaller particles recorded by the cloud probe.



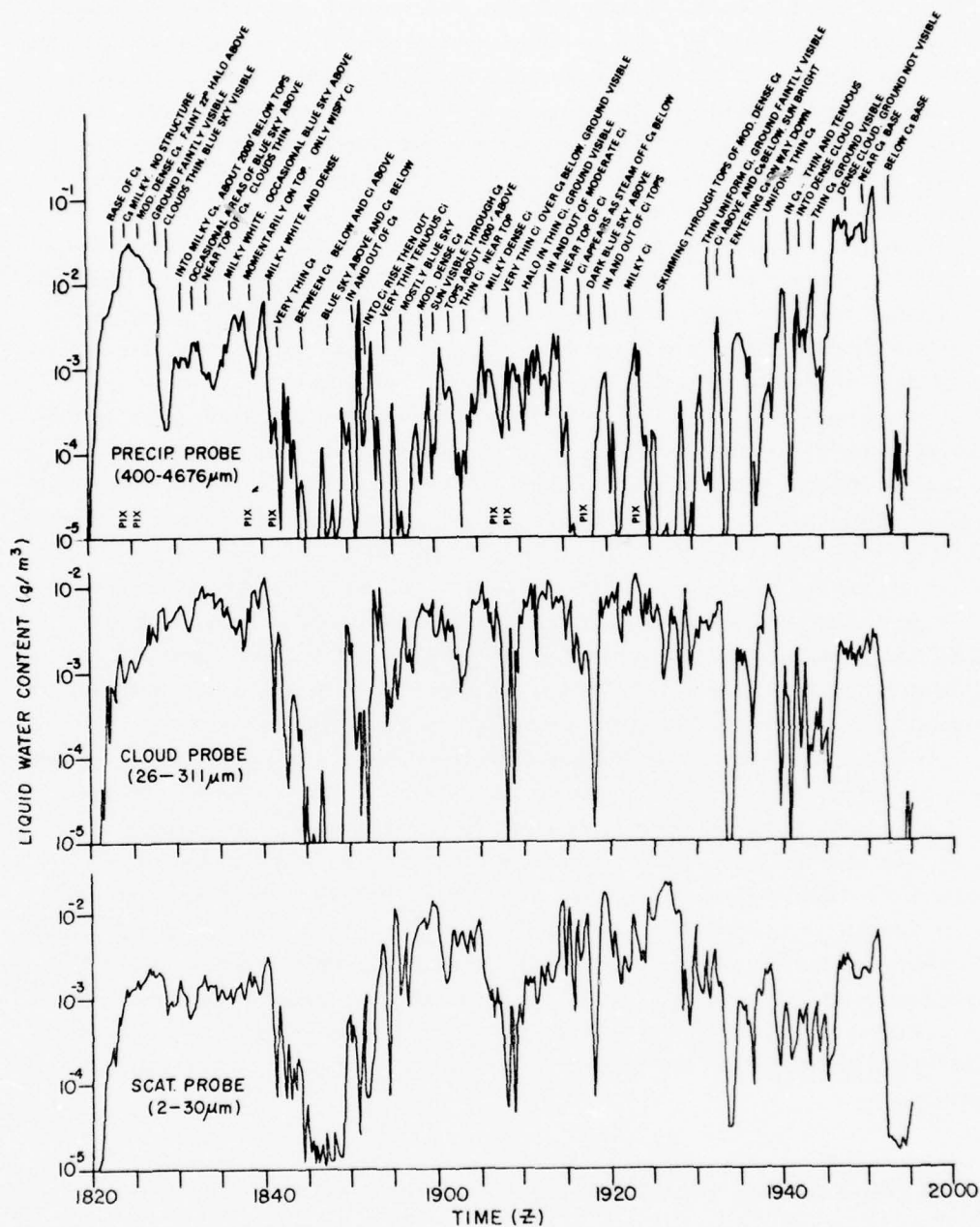


Figure 6. Variation of Liquid Water Content With Time as Determined by Three PMS Spectrometer Probes. Sampling altitude: 16,000 ft (4.8 km) to 29,000 ft (8.8 km) MSL. 26 February 1978, Albuquerque

The correlation, however, between visibility observations and precipitation probe LWC was not exact. It could possibly be improved by making more detailed visual observations and by using smaller time intervals than 15 sec to construct the curves of Figure 6. Such smaller intervals might, however, result in sampling volumes being too small and the outcome, therefore, not being significant. Similar plots of data based on 60-sec averages showed considerably poorer correlation—apparently due to the dilution of high LWC values with low ones, or vice versa, as clouds were entered and exited in rapid succession.

In determining particle habit or shape, primary dependence was placed on the PMS 2-D printouts of particle forms since the formvar replicator was not operated during this flight. Similar to the findings in our first cirrus report,<sup>1</sup> there were very few symetrically-shaped, text book examples of pristine columns, plates, dendrites, or other classical ice crystal shapes.

In reviewing the 2-D shadowgraph forms, the type seen most frequently from the beginning of the flight until 1823Z (5.7 km altitude) was "small snow". This type consists of agglomerates of smaller individual crystals, which together do not exceed approximately 1/2 mm in size. The particles encountered in the descending portion of the flight after 1946Z (5.8 km) were also of a small snow nature.

The particle form seen most frequently in sampling at the higher altitudes, between 5.7 and 8.8 km (1823-1946Z), was the bullet rosette. Although single columns and plates were not rare the preponderance of discernable shapes appeared to be of the rosette form. As indicated in the literature review of our first cirrus report,<sup>1</sup> the bullet rosette shape is common at cirrus altitudes.

For use at such cold altitudes there are few instruments available to count and size ice crystals smaller than those recorded by the PMS cloud probe ( $\sim 26 \mu\text{m}$ ). The PMS axial scattering probe used in the AFGL aircraft for this purpose was originally intended for use with liquid particles. As pointed out by Ryan et al,<sup>7</sup> since the scattering properties of ice crystals are not known, only apparent size distributions can be reported by this probe in cirrus clouds. Despite this problem it is believed the ice particle populations between 2 and approximately  $30 \mu\text{m}$  that are observed by the scattering probe are reasonable estimates of their real values.

Particle distributions determined by all three probes during the 26 February 1978 flight are presented in Appendix B in terms of averages for consecutive 30-sec periods.

## 5. EXAMPLES OF 15-SECOND AVERAGE PARTICLE DISTRIBUTIONS

After a review of the mission director's notes, the nose camera film and the variation of LWC in Figure 6, eight segments during the flight were selected to

7. Ryan, R. T., Blau, J. H., Jr., vonThuna, P. C., and Cohen, M. L. (1972)  
Cloud microstructure as determined by an optical cloud particle spectrometer.  
J. Appl. Meteor. 11:151-156.

study further. These eight times, which are marked "PIX" on Figure 6, were chosen as representative occasions when cirriform clouds of various densities were present. Primary emphasis was on the relatively thin cirrus clouds in which Air Force Weapons Laboratory personnel had previously expressed interest; however, two occasions were also included for comparison when more dense cirro-stratus clouds were being sampled.

Selected frames from the 16-mm movie nose camera are included as Figures 7a through 14a to provide visual documentation of the eight cirrus situations examined. Each of these pictures was taken simultaneously with or a few seconds before particle data were recorded by the various spectrometer probes. The figures on the pictures represent the time in hours, minutes, and seconds that were automatically projected on the film from the aircraft time code generator. The second digit of the hour was not properly projected and this position is vacant in each photo. There was no problem, however, in determining the correct hour since elapsed flight time was less than three hours.

Spectrometer particle data concurrent with each photograph time are shown in Figures 7b through 14b. The "b" figures show plots of particle number density as a function of particle size derived from data averaged over 15-sec intervals near the time the "a" figures were photographed. In the upper right hand corner the total median volume diameter (DIA) and total liquid water content (LWC) of particles recorded by each of the three probes are recorded. The diameter values are those that unfrozen particles having a mass at the median value of each probe's LWC would have.

Because of the deletion of the overlapping amount plus slightly more the C + P (cloud probe plus precipitation probe) LWC and DIA values are sometimes slightly less than the amounts indicated for either the cloud or precipitation probe individually. The two values below "Totals" on the "b" figures and on the printouts in Appendix A and B will similarly be occasionally less than their contributing components.

A few 2-D particle form examples for time approximating the 1-D data acquisition times are shown on the "b" figures. In most cases these were recorded over periods not exceeding 1 - 2 seconds. Dimensions of nearly all 2-D forms may be approximated from knowledge that the height of the vertical bars in these illustrations is  $800\text{ }\mu\text{m}$ . A single exception is shown in Figure 7b where the line of 2-D forms recorded at 1951:25Z is from the PMS 2-D precipitation probe. The dimension of the vertical lines in this row is  $6400\text{ }\mu\text{m}$ . The 2-D precipitation probe records only the larger sized particles and is seldom activated during cirrus flights.

Figures 7c through 14c are the PMS 1-D data printouts of particle concentration as a function of size for times corresponding to the information shown in Figures 7a and 7b through 14a and 14b. Each of these "c" figures provides data averaged over 15-sec intervals for two consecutive 15-sec periods. The "b" figures were prepared from data for one of these periods.

### 5.1 Example No. 1: 1823:51Z

Figures 7a, b, and c represent a situation where the aircraft was near the base of a cirrostratus (Cs) layer that varied from 6000 to 8000 ft thick. The ground was still visible below, but visibility was rapidly reduced in moving upward toward the horizon. The location of the sun was discernable above through the milky white cloud. The Figure 7a picture and that shown in Figure 8a were taken in one of the higher peaks of the LWC of the precipitation probe (see Figure 6).

Although the median volume diameter of the precipitation probe droplets (and of the total C + P value) was greater at that time than at any other shown in Figures 8 through 14 it is noteworthy that the LWC of the cloud probe was least. Apparently these particles fell from higher altitudes and grew larger by collecting or aggregating the smaller cloud-sized particles. Heymsfield<sup>3</sup> also found aggregation to occur in a cirrus cloud at  $-20^{\circ}\text{C}$  and warmer. The temperature at 1824Z was  $-20^{\circ}\text{C}$ .

The 2-D forms shown on Figure 7b were recorded approximately 1-1/2 hr after the picture and 1-D data were recorded. This substitution of later 2-D data was necessary since the 2-D equipment was not operating when the aircraft ascended through the cloud base at 1824Z. In choosing 2-D forms that were representative of the other Figure 7 data an effort was made to match 1-D spectra data on descent with those recorded on ascent at 1824Z. It is believed the 2-D particle forms in Figure 7b closely approximate those that would have been seen at that time.

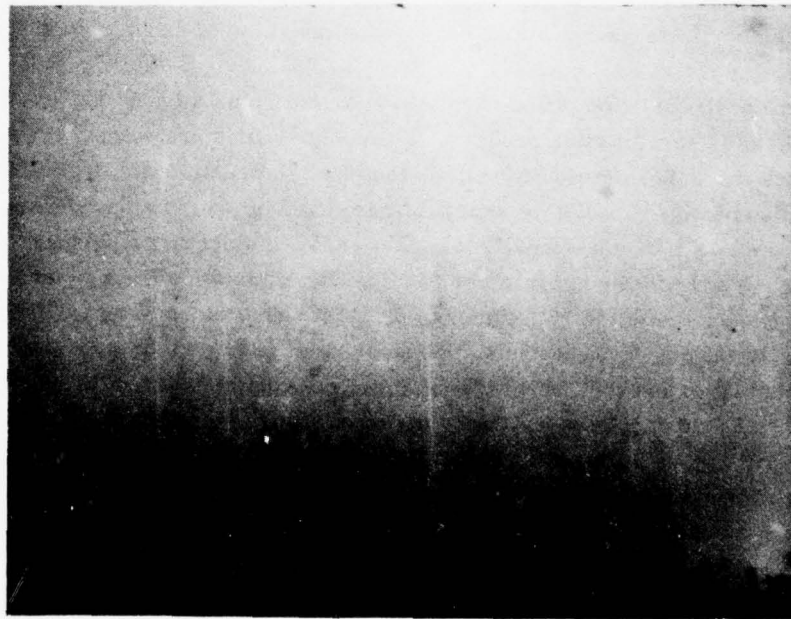


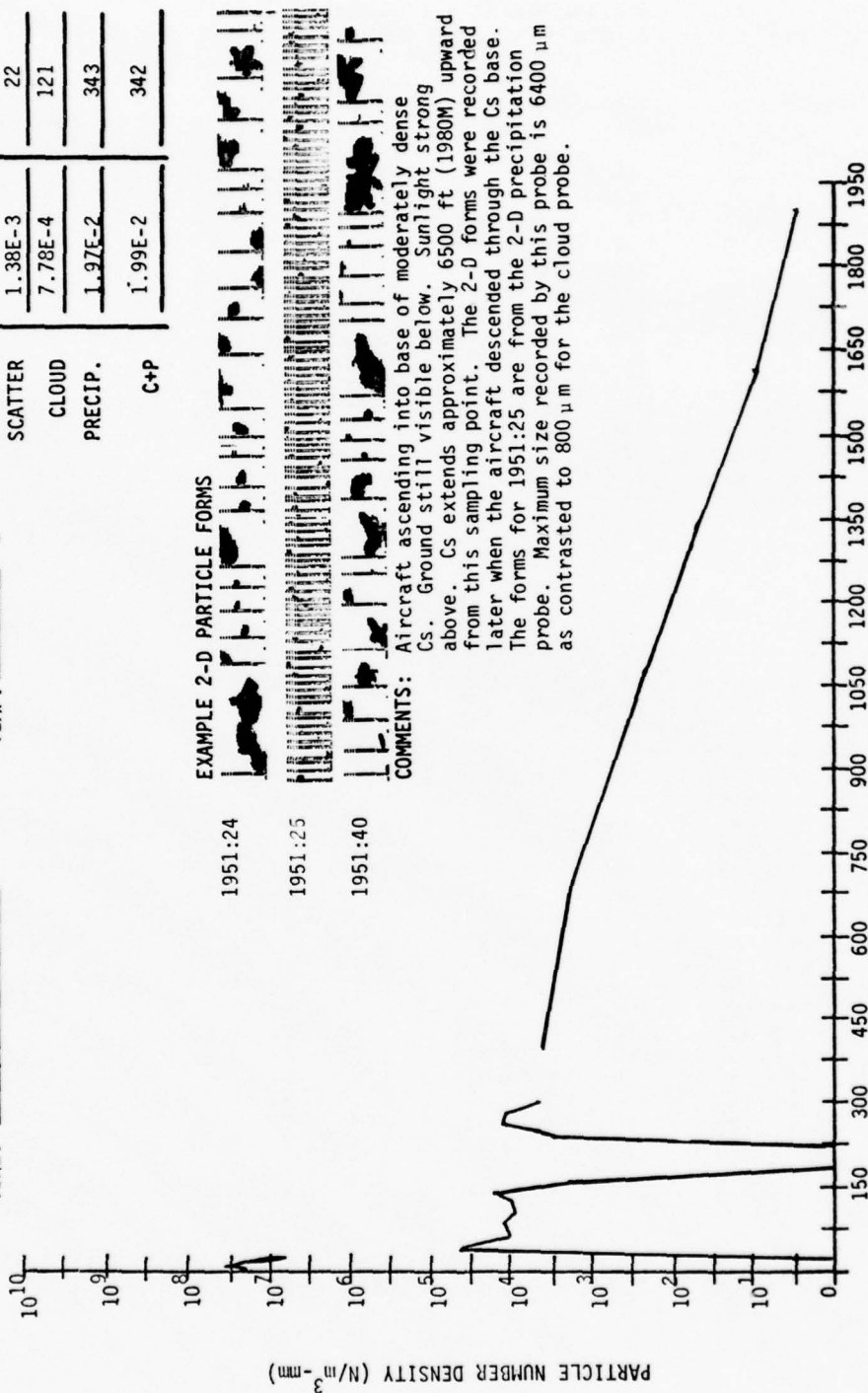
Figure 7a. Selected 16-mm Frame 1823:51Z, Base of Cs 5.9 km MSL, Temperature  $-19.8^{\circ}\text{C}$



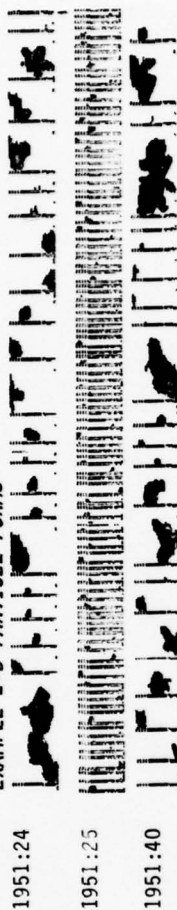
DATE: 26 Feb 78  
TIME: 1824:10 - 1824:24

ALTITUDE 5.9 km  
TEMP. -19.8 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	1.38E-3	22
CLOUD	7.78E-4	121
PRECIP.	1.97E-2	343
C+P	1.99E-2	342



#### EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Aircraft ascending into base of moderately dense Cs. Ground still visible below. Sunlight strong above. Cs extends approximately 6500 ft (1980M) upward from this sampling point. The 2-D forms were recorded later when the aircraft descended through the Cs base. The forms for 1951:25 are from the 2-D precipitation probe. Maximum size recorded by this probe is 6400 μm as contrasted to 800 μm for the cloud probe.

PARTICLE SIZE (μm)

Figure 7b. Spectrometer Particle Data for Figure 7a

AFGL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
INTERVAL START \*18:24:10\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.45E+06	25	0.	400	4.02E+03	476.0
4	7.44E+06	47	4.23E+04	706	1.78E+03	ALT (KM)
6	1.20E+07	67	1.02E+04	1011	3.24E+02	5.934
8	1.78E+07	87	1.21E+04	1316	6.17E+01	
10	2.29E+07	108	8.21E+03	1522	1.01E+01	TEMP (C)
12	3.31E+07	128	9.04E+03	1927	5.11E+00	-19.8
14	2.11E+07	148	1.67E+04	2233	1.65E+00	
16	2.51E+07	169	1.93E+03	2538	0.	DEWP (C)
18	1.82E+07	189	0.	2843	0.	
20	1.26E+07	209	0.	3149	0.	
22	2.05E+07	230	0.	3454	0.	TAS (M/S)
24	9.14E+06	250	2.80E+03	3760	0.	105.7
25	8.58E+05	271	1.26E+04	4065	0.	
28	5.12E+05	291	1.08E+04	4370	0.	
30	9.16E+05	311	4.17E+03	4676	0.	
						TOTALS
LWC	1.39E-03		7.78E-04		1.97E-02	1.99E-02
MED D	22		121		343	342

INTERVAL START \*18:24:25\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.04E+06	25	0.	400	4.43E+03	471.7
4	8.05E+06	47	1.30E+05	706	1.95E+03	ALT (KM)
6	9.21E+06	67	1.01E+04	1011	3.74E+02	5.933
8	1.44E+07	87	1.21E+04	1316	7.18E+01	
10	2.36E+07	108	8.19E+03	1522	1.31E+01	TEMP (C)
12	2.70E+07	128	1.52E+04	1927	3.08E+00	-20.4
14	2.36E+07	148	1.20E+04	2233	1.63E+00	
16	2.53E+07	169	3.95E+03	2538	1.75E+00	DEWP (C)
18	2.01E+07	189	0.	2843	0.	
20	1.49E+07	209	0.	3149	0.	
22	1.27E+07	230	5.10E+03	3454	0.	TAS (M/S)
24	8.62E+05	250	2.83E+03	3760	0.	104.3
25	6.91E+05	271	3.20E+03	4065	0.	
28	4.03E+05	291	3.65E+03	4370	0.	
30	5.13E+05	311	2.13E+04	4676	0.	
						TOTALS
LWC	1.14E-03		1.02E-03		2.21E-02	2.24E-02
MED D	21		133		347	345

Figure 7c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 7b and the Photo in Figure 7a

## 5.2 Example No. 2: 1825:30Z

Figures 8a, b, and c depict another moderately dense cirrostratus situation where the aircraft had moved about 0.3 km higher into the cloud than at the time recorded in Figures 7a, b, and c. Uniform milky Cs extended about 5000 ft (1.5 km) above the observer and a thin halo was around the sun which was dimly visible. The LWC measured by the precipitation probe was greater for this example than for the other seven times discussed here, while the median volume diameter was approximately the same as the Figure 7b occasion.

Although some channels of the cloud probe recorded no particles in the relatively dense cirrostratus, it is to be noted in both Figures 7b and 8b that there is a gradual but discontinuous increase in number density as particle size decreases. At the higher altitudes examined in most of the figures from Figures 9b through 14b this fairly smooth increase in concentration with diminishing size was interrupted by a second maximum in the cloud probe data.

The particle spectrum shown in Figure 8b is similar to that examined by Glass and Varley<sup>8</sup> during another study of cirrus conditions at the time a halo was present. Their case, however, indicated slightly fewer particles in the 50 to 100  $\mu$ m range than those shown in Figure 8b.



Figure 8a. Selected 16-mm Frame 1825:30Z, In Cs 6.2 km MSL, Temperature  $-22.3^{\circ}\text{C}$

8. Glass, M., and Varley, D. J. (1978) Observations of cirrus particle characteristics occurring with halos. In Preprints of Conference on Cloud Physics and Atmospheric Electricity, Amer. Meteor. Soc. pp 126-128. Also, AFGL-TR-78-0196.

DATE: 26 Feb 78  
TIME: 1825:40 - 1825:54

ALTITUDE 6.2 km  
TEMP. -22.3 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	1.39E-3	21
CLOUD	1.32E-3	119
PRECIP.	2.54E-2	341
C+P	2.59E-2	337

# EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In moderately dense Cs. High LWC values here and in similar part of cloud upon descent. A halo is seen around the sun although the milky, uniform cloud extends upward approximately 5000 ft (1520m) from the sampling point.

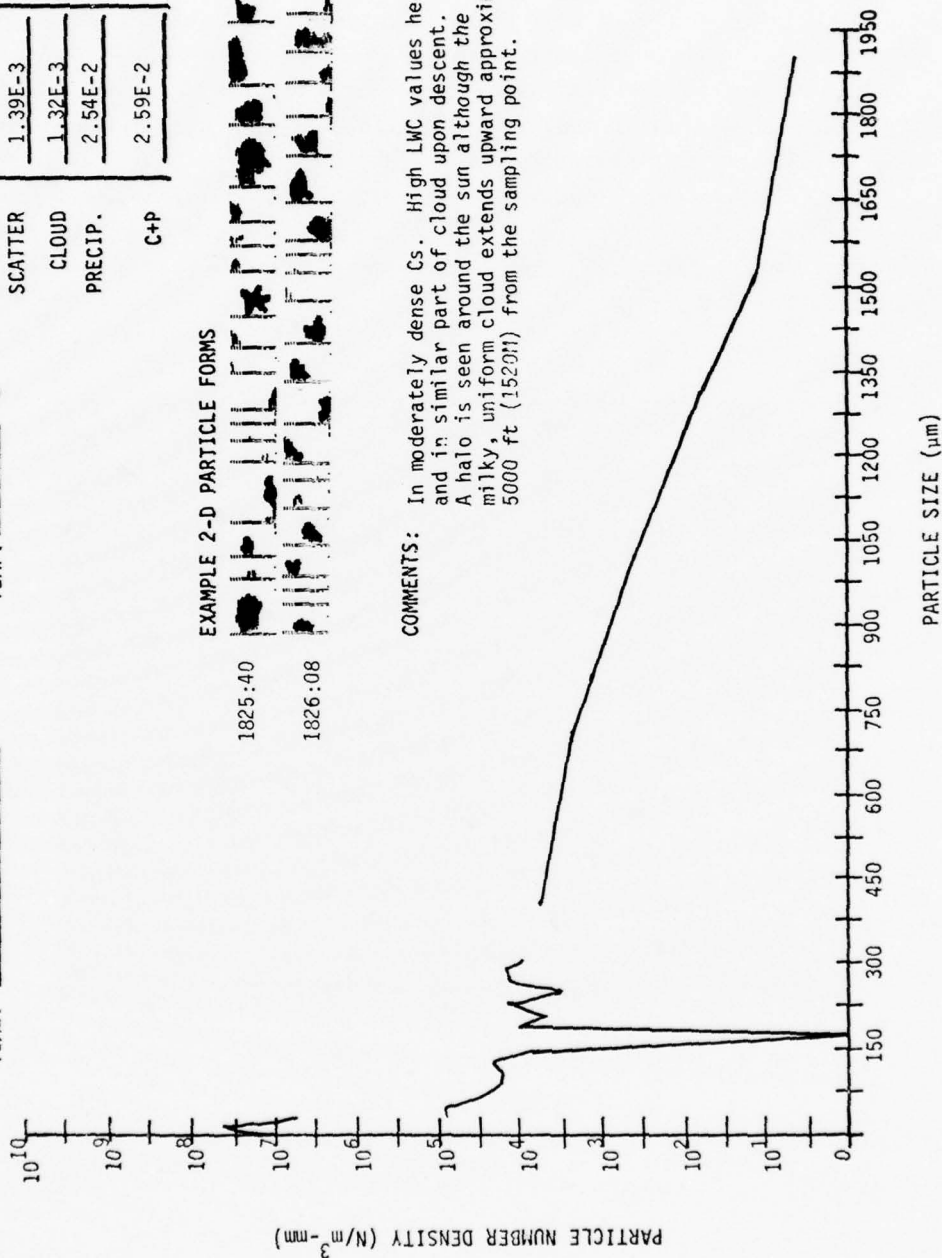


Figure 8b. Spectrometer Particle Data for Figure 8a



AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING

INTERVAL START \*13:25:40\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.30E+05	26	8.19E+04	400	5.60E+03	453.9
4	9.22E+05	47	8.65E+04	706	2.25E+03	ALT (KM)
6	2.07E+07	67	3.03E+04	1011	4.28E+02	5.273
8	2.76E+07	87	1.81E+04	1316	3.08E+01	TEMP (C)
10	3.68E+07	109	1.65E+04	1522	1.31E+01	-22.3
12	4.20E+07	128	2.13E+04	1927	6.18E+00	
14	3.85E+07	148	7.18E+03	2233	4.92E+00	DEWP (C)
16	2.87E+07	169	0.	2538	0.	
18	2.88E+07	189	1.07E+04	2843	0.	
20	1.72E+07	209	4.65E+03	3149	0.	TAS (M/S)
22	1.03E+07	230	1.54E+04	3454	0.	104.3
24	7.48E+05	250	2.83E+03	3760	0.	
26	1.04E+07	271	1.28E+04	4065	0.	
28	6.91E+05	291	1.46E+04	4370	0.	
30	4.60E+05	311	8.51E+03	4676	0.	
LWC	1.39E-03		1.32E-03		2.54E-02	TOTALS
MED D	21		119		341	2.59E-02
						337

INTERVAL START \*13:25:55\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.85E+05	26	0.	400	5.52E+03	451.2
4	1.26E+07	47	8.59E+04	706	2.15E+03	ALT (KM)
6	1.20E+07	67	3.01E+04	1011	3.65E+02	5.321
8	2.35E+07	87	1.21E+04	1316	5.33E+01	TEMP (C)
10	3.44E+07	108	2.04E+04	1522	7.27E+00	-22.7
12	3.95E+07	128	9.09E+03	1927	5.13E+00	
14	3.26E+07	148	7.14E+03	2233	1.62E+00	DEWP (C)
16	3.54E+07	169	1.18E+04	2538	0.	
18	2.17E+07	189	2.45E+03	2843	0.	
20	1.83E+07	209	0.	3149	0.	TAS (M/S)
22	1.43E+07	230	5.04E+03	3454	0.	105.6
24	1.25E+07	250	1.14E+04	3760	0.	
26	8.55E+05	271	1.27E+04	4065	0.	
28	5.71E+05	291	1.45E+04	4370	0.	
30	1.03E+07	311	1.68E+04	4676	0.	
LWC	1.58E-03		1.51E-03		2.32E-02	TOTALS
MED D	22		123		332	2.35E-02
						330

Figure 8c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 8b and the Photo in Figure 8a

### 5.3 Example No. 3: 1838:14Z

The Figure 9a, b, and c series was seen or recorded about 13 min later and 1.4 km higher than that of the preceeding series. Blue sky was evident above, although the aircraft was still approximately 1000 ft (300 m) below the top of the Cs. In the direction of the horizon the cloud appeared to be fairly heavy. Each of the probes recorded the same magnitude of liquid water content though the cloud probe had a slightly greater contribution.

From the time represented by Figure 8a to that of Figure 9a the size and mass recorded by the precipitation probe had decreased significantly, while those of the cloud probe had increased. The LWC of the scatter probe also increased slightly, although visible cloud density decreased. Particle size had substantially diminished as the aircraft climbed higher toward the top of the cirrostratus layer.

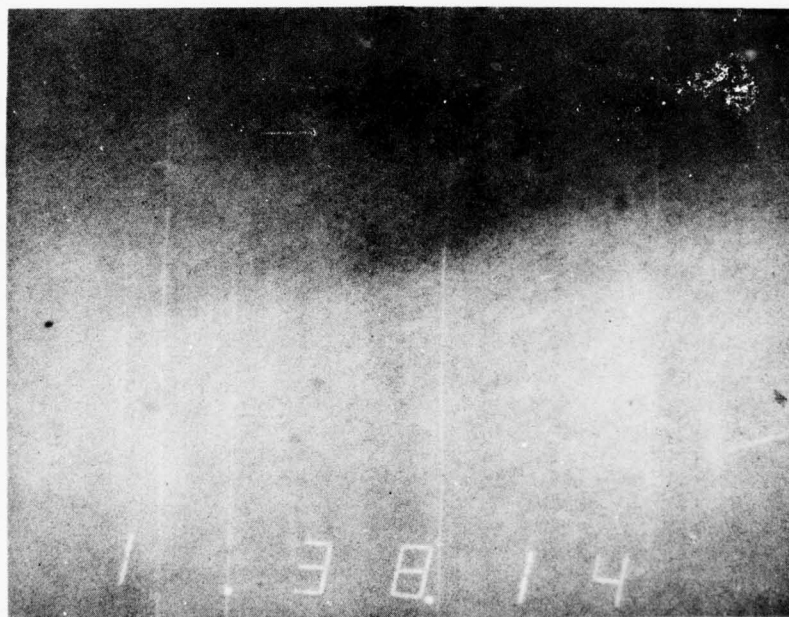


Figure 9a. Selected 16-mm Frame 1838:14Z, Near Cs tops 7.6 km MSL, Temperature  $-29.9^{\circ}\text{C}$

DATE:	26 Feb 78	ALTITUDE	7.6 km	LWC	DIA
TIME:	1838:25 - 1838:39	TEMP.	-29.9 °C	(G/M <sup>3</sup> )	(μm)
		SCATTER	2.02E-3	21	
		CLOUD	5.53E-3	129	
		PRECIP.	4.42E-3	192	
		C+P	4.89E-3	183	

# EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Uniform Cs. Approximately 1000 ft (305M) below top of the cloud layer. Ground not visible below.

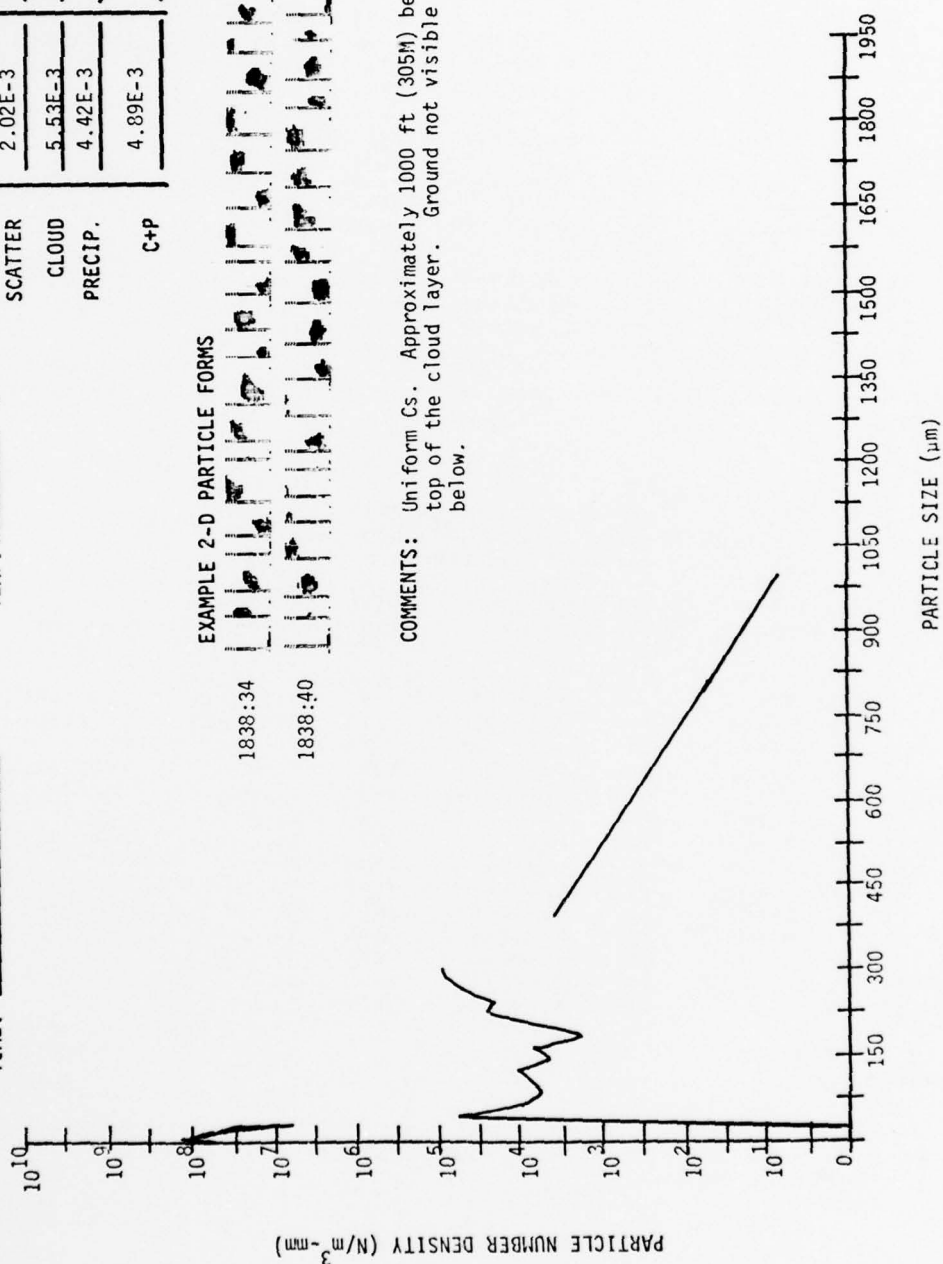


Figure 9b. Spectrometer Particle Data for Figure 9a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING

INTERVAL START \*10:38:10\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	P (MB)
2	5.60E+05	26	0.	400	3.48E+03	376.3
4	5.09E+07	47	5.73E+04	706	2.46E+02	ALT (KM)
6	8.85E+07	67	8.96E+03	1311	4.65E+00	7.611
8	7.94E+07	87	2.67E+04	1316	0.	TEMP (C)
10	4.94E+07	108	2.18E+04	1522	0.	-29.3
12	3.67E+07	128	5.38E+03	1927	0.	DEWP (C)
14	2.75E+07	148	2.12E+03	2233	0.	
16	2.70E+07	169	1.74E+03	2538	0.	
18	2.85E+07	189	5.67E+03	2843	0.	
20	1.69E+07	209	2.05E+03	3149	0.	TAS (M/S)
22	1.12E+07	230	1.59E+04	3454	0.	118.5
24	1.12E+07	250	1.01E+04	3760	0.	
26	9.16E+05	271	1.98E+04	4065	0.	
28	1.22E+07	291	1.62E+04	4370	0.	
30	9.16E+05	311	4.15E+04	4676	0.	
LWC	1.69E-03		2.35E-03		4.23E-03	TOTALS
MED D	23		130		202	4.51E-03
						134

INTERVAL START \*11:38:25\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	P (MB)
2	3.01E+07	26	0.	400	4.07E+03	376.4
4	1.26E+08	47	5.75E+04	706	1.69E+02	ALT (KM)
6	1.23E+08	67	9.00E+03	1311	6.98E+00	7.613
8	1.03E+08	87	5.35E+03	1316	0.	TEMP (C)
10	7.14E+07	108	7.29E+03	1522	0.	-29.3
12	6.43E+07	128	1.08E+04	1927	0.	DEWP (C)
14	4.75E+07	148	4.24E+03	2233	0.	
16	4.03E+07	169	7.00E+03	2538	0.	
18	3.88E+07	189	1.89E+03	2843	0.	
20	2.04E+07	209	5.19E+03	3149	0.	TAS (M/S)
22	1.22E+07	230	2.49E+04	3454	0.	118.4
24	1.28E+07	250	2.02E+04	3760	0.	
26	1.65E+07	271	4.25E+04	4065	0.	
28	1.07E+07	291	7.45E+04	4370	0.	
30	5.10E+05	311	8.69E+04	4676	0.	
LWC	2.02E-03		5.53E-03		4.42E-03	TOTALS
MED D	21		129		192	4.59E-03
						183

Figure 9c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Lower One Corresponds to the Plotted Values on Figure 9b and the Photo in Figure 9a

#### 5.4 Example No. 4: 1842:07Z

Figures 10a, b, and c represent a time when the aircraft was in the upper portion of very thin cirrostratus. The horizon was faintly visible. Snow capped mountains about five miles distant may be seen in the lower foreground of Figure 10a. Although this figure indicates thin cirriform clouds straight ahead near the horizon the base of the cirrus layer was estimated to be more than a thousand feet above the aircraft.

The particle population recorded by each of the probes at this time was quite low. In fact, the liquid water content determined by the scattering probe was smaller at this time than at any of the other specific times studied here; the overall LWC of the "cloud plus precipitation" probes was also smallest. Even though several of the individual cloud probe channels recorded no particles this probe recorded the highest LWC measurement of the three—although it was still relatively low when compared to other cirrus situations.

The greatest contribution to the mass determined by the cloud probe was apparently made by particles in the 200 to 250  $\mu\text{m}$  range according to Figure 10b. The concentration or density falls off for sizes both smaller and larger than this.

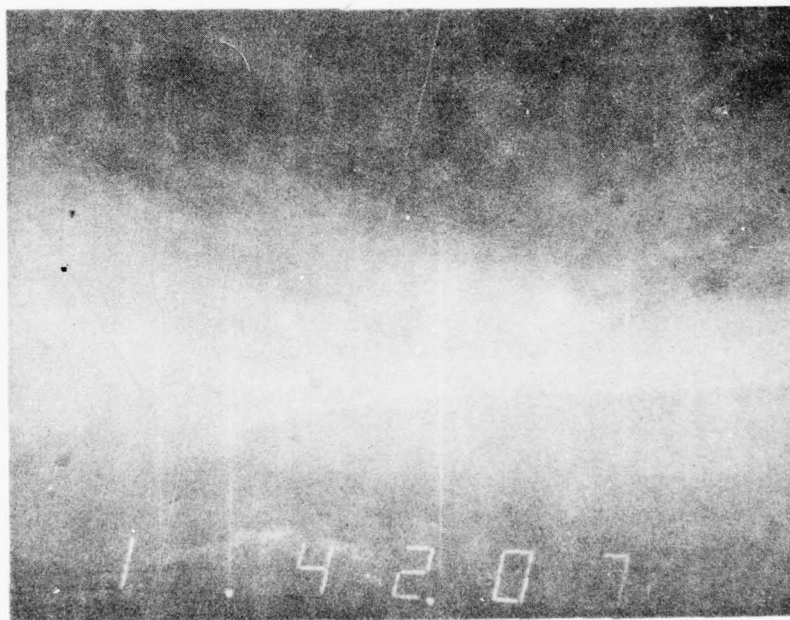


Figure 10a. Selected 16-mm Frame 1842:07Z, Very Thin Cs 8.5 km MSL, Temperature  $-30.3^{\circ}\text{C}$



DATE: 26 Feb 78  
 TIME: 1842:10 - 1842:24

ALTITUDE 7.6 km  
 TEMP. -30.3 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	4.74E-4	21
CLOUD	2.36E-3	105
PRECIP.	8.09E-5	192
C+P	1.27E-3	92

# EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In upper portion of thin Cs cloud. Cirrus layer is based about 1300 ft (400M) above flight level. Contribution of precipitation probe to LWC is small

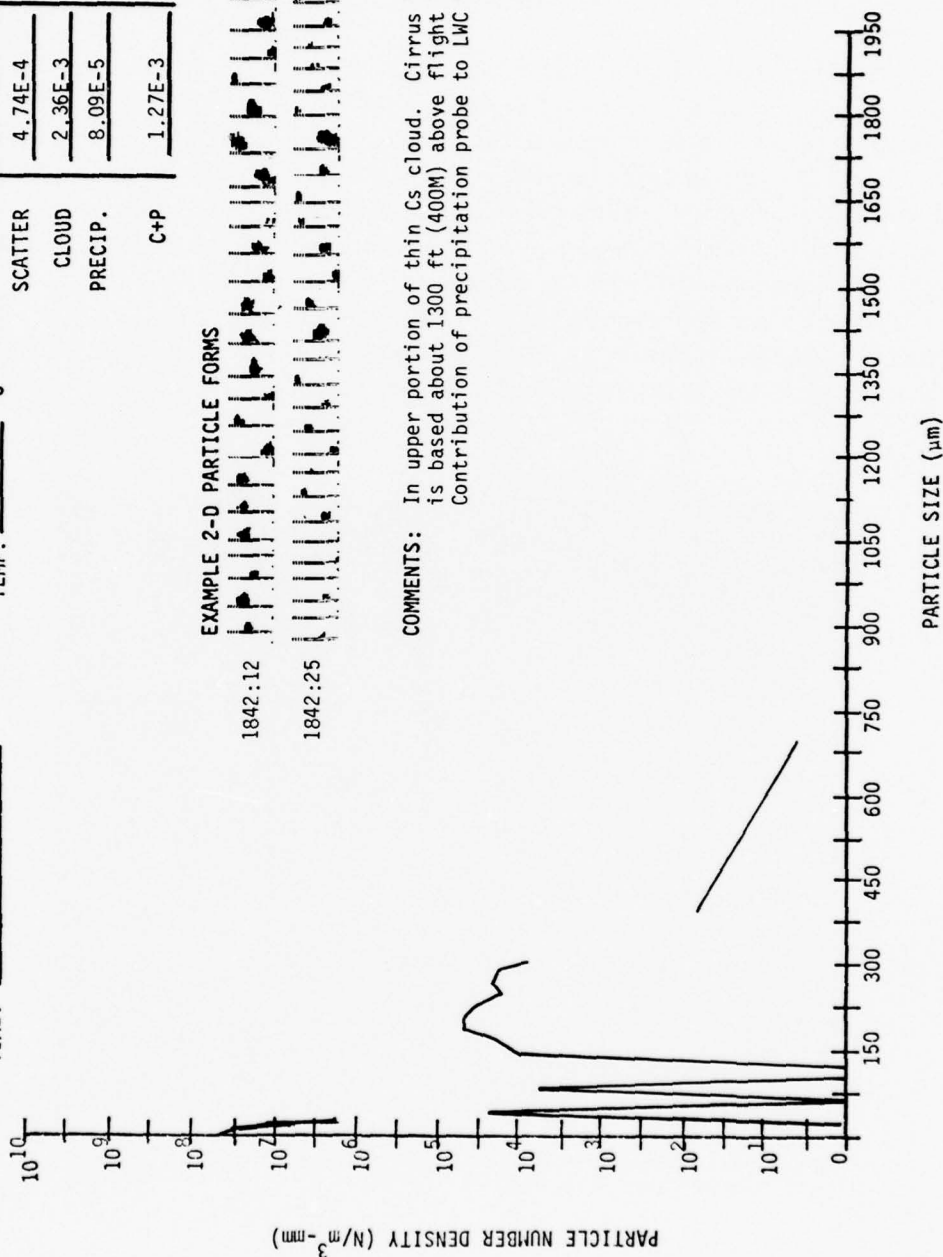


Figure 10b. Spectrometer Particle Data for Figure 10a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
INTERVAL START \*18:42:10\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.32E+03	26	0.	400	7.47E+01	376.7
4	4.19E+07	47	1.98E+04	706	3.44E+00	ALT (KM)
6	3.18E+07	67	0.	1011	0.	7.634
8	2.33E+07	87	5.54E+03	1316	0.	TEMP (C)
10	2.07E+07	109	0.	1522	0.	-30.3
12	1.64E+07	129	0.	1927	0.	DEWP (C)
14	1.22E+07	148	6.80E+03	2233	0.	TAS (M/S)
16	1.01E+07	169	1.64E+04	2538	0.	114.3
18	5.30E+06	189	4.72E+04	2843	0.	
20	5.30E+06	209	4.71E+04	3149	0.	
22	4.76E+06	230	3.30E+04	3454	0.	
24	1.59E+06	250	1.57E+04	3760	0.	
26	2.65E+06	271	2.06E+04	4065	0.	
28	3.17E+06	291	1.68E+04	4370	0.	
30	1.59E+06	311	7.85E+03	4676	0.	
LWC	4.74E-04		2.36E-03		8.09E-05	TOTALS
MED D	21		105		192	1.27E-03
						32

INTERVAL START \*19:42:25\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	8.32E+03	26	0.	400	7.65E+00	375.1
4	1.26E+07	47	0.	706	1.15E+00	ALT (KM)
6	7.35E+06	67	9.30E+03	1011	0.	7.633
8	4.22E+06	87	5.50E+03	1316	0.	TEMP (C)
10	5.79E+06	109	3.75E+03	1522	0.	-30.3
12	3.16E+06	129	8.34E+03	1927	0.	DEWP (C)
14	5.28E+06	148	0.	2233	0.	TAS (M/S)
16	2.10E+06	169	1.81E+03	2538	0.	115.1
18	3.16E+06	189	7.80E+03	2843	0.	
20	0.	209	2.13E+03	3149	0.	
22	1.05E+06	230	9.37E+03	3454	0.	
24	5.29E+06	250	0.	3760	0.	
26	5.26E+06	271	0.	4065	0.	
28	1.05E+06	291	0.	4370	0.	
30	5.27E+06	311	0.	4676	0.	
LWC	1.21E-04		2.27E-04		1.20E-05	TOTALS
MED D	22		90		230	2.39E-04
						33

Figure 10c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 10b and the Photo in Figure 10a

### 5.5 Example No. 5: 1907:39Z

Figure 11a shows a situation where the aircraft was in very thin cirrus at 28,000 ft (8.5 km) with cirrostratus below. Less than a minute after this photo was taken the mission director reported he could see the ground clearly through the milky, thin Cs. The tops of the thin cirrus were believed to be about 1000 ft (300 m) above flight level.

The large variation of particles in both size and shape is shown in the 2-D forms on Figure 11b. As noted there, the majority of recognizable particles appears to be composed of the bullet rosette form and vary from approximately 200 to 500  $\mu\text{m}$  in their largest dimension. The mean "diameter" values shown on Figure 11b and the other "b" figures are smaller than the 2-D particle dimensions since they represent spherical "melted" droplets having the same mass as the larger frozen crystals.

As in most of the other particular cirrus cases described in this section the largest contribution to total liquid water content was made by the particles in the 26 to 311  $\mu\text{m}$  range that are observed by the cloud probe.

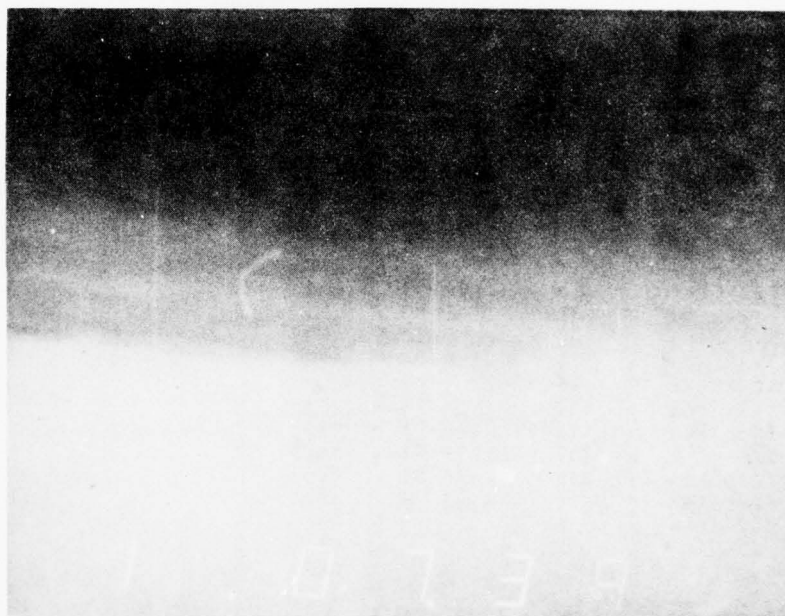


Figure 11a. Selected 16-mm Frame 1907:39, Thin Ci 8.5 km MSL, Temperature  $-33.5^{\circ}\text{C}$



DATE: 26 Feb 78  
TIME: 1907:40 - 1907:54

ALTITUDE 8.5 km  
TEMP. -33.5 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	7.09E-4	22
CLOUD	2.82E-3	111
PRECIP.	2.57E-4	192
C+P	1.48E-3	93

# EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Very thin cirrus at flight altitude. Milky, thin Cs below. Greatest contribution to LWC is from cloud probe (particles 26 - 311 μm). Particles are predominantly bullet rosette type. The C+P diameter value for the next 15 second record increased to 171 μm.

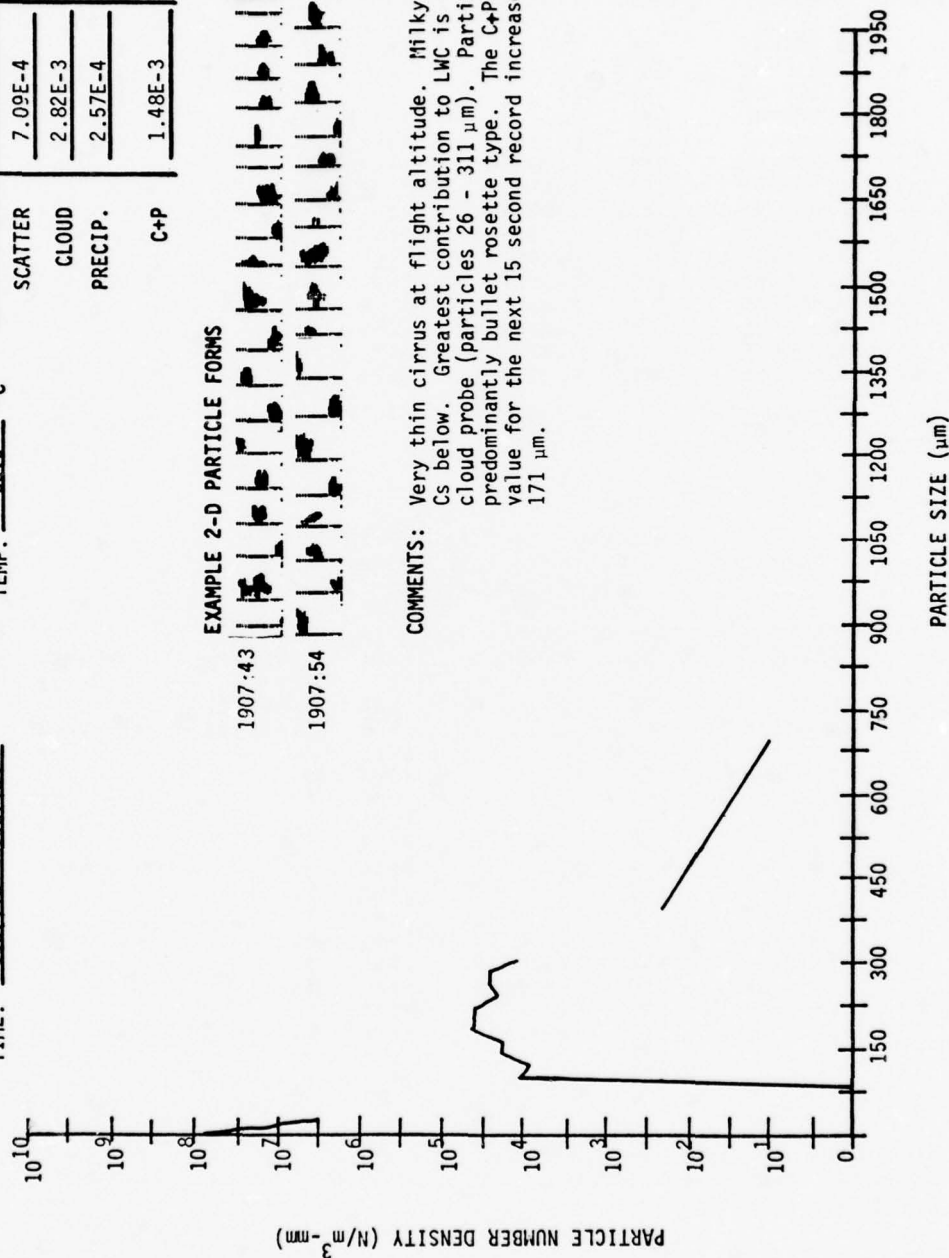


Figure 11b. Spectrometer Particle Data for Figure 11a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING

INTERVAL START \*19:07:40\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	P (MB)
2	1.73E+03	26	0.	400	2.37E+02	331.2
4	5.50E+07	47	0.	706	1.09E+01	ALT (KM)
6	3.94E+07	67	0.	1011	0.	8.492
8	2.57E+07	87	0.	1316	0.	
10	2.49E+07	108	1.08E+04	1522	0.	TEMP (C)
12	2.42E+07	128	8.02E+03	1927	0.	-33.5
14	1.01E+07	148	1.89E+04	2233	0.	
16	1.06E+07	169	1.73E+04	2538	0.	DEWP (C)
18	1.11E+07	189	4.30E+04	2943	0.	
20	6.06E+06	209	4.08E+04	3149	0.	
22	5.55E+05	230	3.60E+04	3454	0.	TAS (M/S)
24	5.56E+05	250	2.00E+04	3760	0.	119.3
26	5.05E+05	271	2.52E+04	4065	0.	
28	3.03E+05	291	2.57E+04	4370	0.	
30	3.54E+05	311	1.12E+04	4676	0.	
LWC	7.09E-04		2.82E-03		2.57E-04	TOTALS
MFD D	22		111		192	1.48E-03
						93

INTERVAL START \*19:07:55\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (μ)	SCATTER PROBE	SIZE (μ)	CLOUD PROBE	SIZE (μ)	PRECIP PROBE	P (MB)
2	2.39E+03	26	0.	400	1.91E+02	331.0
4	2.39E+07	47	0.	706	3.26E+00	ALT (KM)
6	9.48E+05	67	0.	1011	0.	8.496
8	4.99E+05	87	0.	1316	0.	
10	2.00E+05	108	0.	1522	0.	TEMP (C)
12	9.93E+05	128	0.	1927	0.	-33.4
14	4.99E+05	148	0.	2233	0.	
16	2.99E+06	169	0.	2538	0.	DEWP (C)
18	2.99E+05	189	0.	2943	0.	
20	3.43E+05	209	0.	3149	0.	
22	4.97E+05	230	2.22E+03	3454	0.	TAS (M/S)
24	0.	250	2.47E+03	3760	0.	120.9
26	9.97E+05	271	5.55E+03	4065	0.	
28	4.99E+05	291	0.	4370	0.	
30	0.	311	3.68E+03	4676	0.	
LWC	1.27E-04		2.58E-04		1.81E-04	TOTALS
MFD D	19		120		181	2.05E-04
						171

Figure 11c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 11b and the Photo in Figure 11a

#### 5.6 Example No. 6: 1908:46Z

The photo shown in Figure 12a was taken 1 min after that of Figure 11a. Although some wispy, thin cirrus extends before the aircraft there is blue sky above. The tops of the cirrus layer were estimated to be about 1000 ft (300 m) above the aircraft's 28,000 ft (8.5 km) flight level. The cirrostratus below was reported to be thinner than it appears in the photo, and the ground was visible through it.

Considering the relative clearness of the sky before the aircraft the  $1.67 \times 10^{-3} \text{ g m}^{-3}$  C + P LWC value seems large; however, it is still two orders of magnitude less than Heymsfield and Knollenberg<sup>5</sup> found in cirrus uncinus that was presumably more dense. The C + P LWC decreased by an order of magnitude in the 15-sec sample recorded after that shown on Figure 12b.

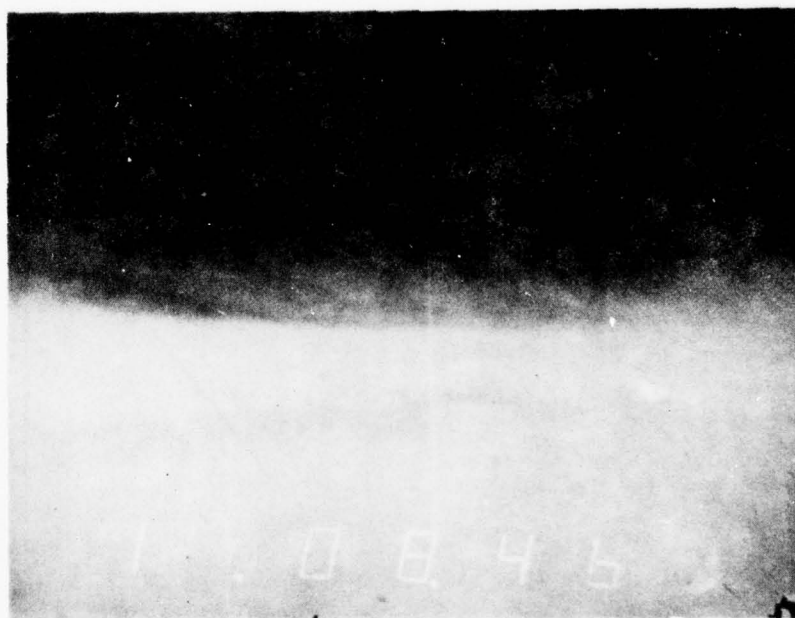


Figure 12a. Selected 16-mm Frame 1908:46, Thin Ci 8.5 km MSL, Temperature  $-33.5^{\circ}\text{C}$

DATE: 26 Feb 78  
 TIME: 1908:40 - 1908:54

ALTITUDE 8.5 km  
 TEMP. -33.5 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	7.85E-4	19
CLOUD	3.11E-3	126
PRECIP.	1.30E-3	184
C+P	1.67E-3	162

# EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Passing through thin cirrus. Tops approximately 1000 ft (305M) above aircraft. Ground visible through thin Cs below. Bullet rosette forms are evident in several of the 2-D forms above.

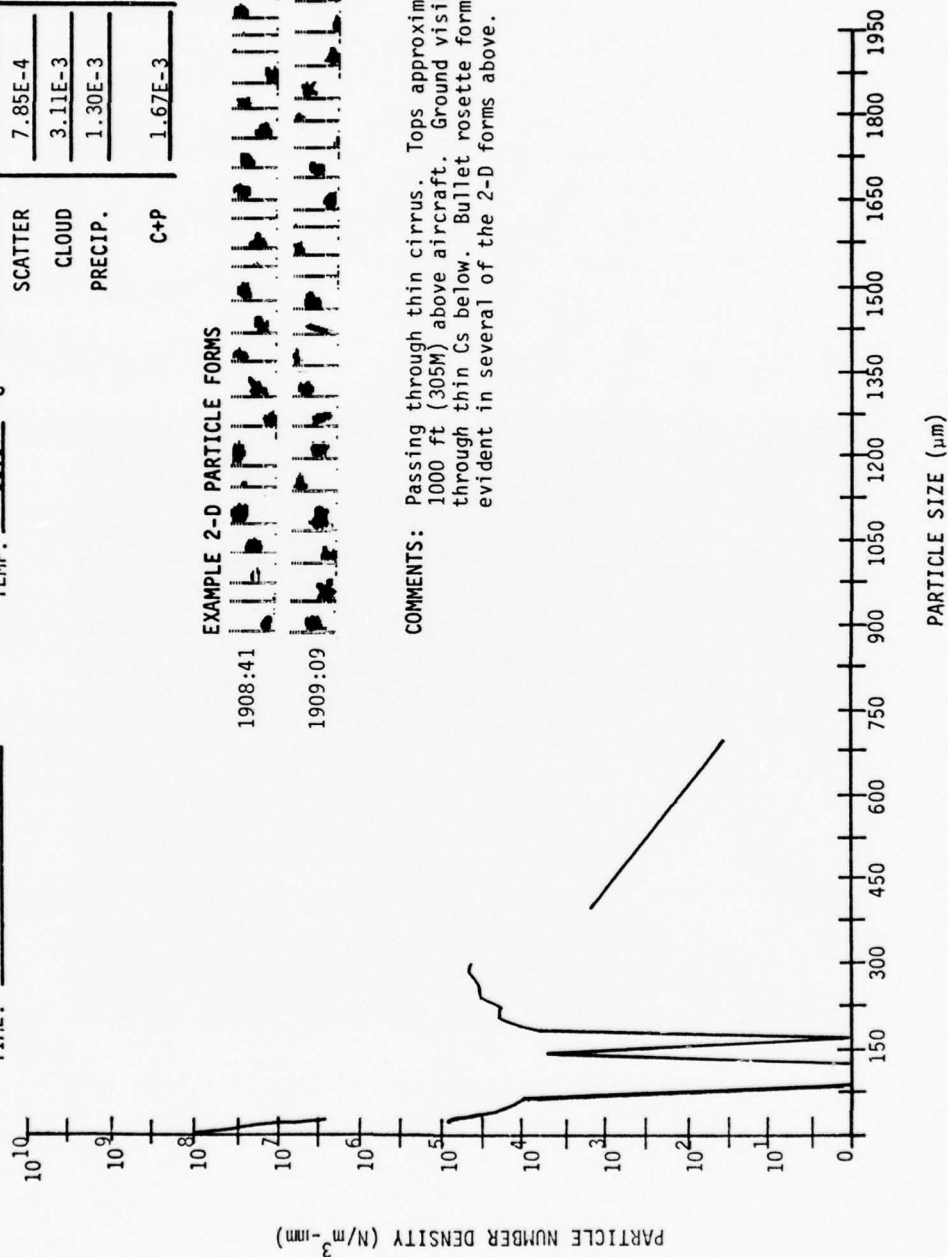


Figure 12b. Spectrometer Particle Data for Figure 12a

AFWL CIRRUS STUDY BY AF3L

FLIGHT E78-03 ON 26 FEB 79 15 SECOND AVERAGING  
INTERVAL START \*19:08:40\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.58E+03	26	7.01E+04	400	1.32E+03	330.5
4	8.01E+07	47	1.85E+04	706	3.21E+01	ALT (KM)
6	5.11E+07	67	8.65E+03	1011	0.	8.517
8	3.54E+07	87	0.	1316	0.	
10	3.74E+07	108	0.	1522	0.	TEMP (C)
12	1.82E+07	128	0.	1927	0.	-33.5
14	1.62E+07	148	4.09E+03	2233	0.	
16	2.65E+07	169	0.	2538	0.	DEWP (C)
18	1.18E+07	189	5.47E+03	2843	0.	
20	9.33E+05	209	1.59E+04	3149	0.	TAS (M/S)
22	5.89E+05	230	1.53E+04	3454	0.	122.9
24	4.91E+05	250	2.67E+04	3760	0.	
26	4.42E+05	271	3.01E+04	4065	0.	
28	3.44E+05	291	3.75E+04	4370	0.	
30	1.96E+05	311	3.64E+04	4676	0.	
LWC	7.85E-04		3.11E-03		1.30E-03	TOTALS
MED D	13		126		184	1.67E-03
						162

INTERVAL START \*19:09:55\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.41E+03	26	0.	400	1.23E+02	330.5
4	2.73E+07	47	0.	706	1.16E+01	ALT (KM)
6	3.89E+05	67	0.	1011	0.	8.507
8	3.89E+05	87	0.	1316	0.	
10	2.43E+05	108	0.	1522	0.	TEMP (C)
12	4.85E+05	128	0.	1927	0.	-33.5
14	2.43E+06	148	0.	2233	0.	
16	4.89E+05	169	0.	2538	0.	DEWP (C)
18	9.77E+05	189	0.	2843	0.	
20	4.85E+05	209	0.	3149	0.	TAS (M/S)
22	0.	230	0.	3454	0.	123.9
24	0.	250	0.	3760	0.	
26	0.	271	2.71E+03	4065	0.	
28	0.	291	0.	4370	0.	
30	0.	311	0.	4676	0.	
LWC	4.76E-05		4.83E-05		1.61E-04	TOTALS
MED D	7		118		210	1.61E-04
						210

Figure 12c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 12b and the Photo in Figure 12a



### 5.7 Example No. 7: 1916:56Z

The photo in Figure 13a shows an example of very thin cirrus at aircraft altitude with a cirrostratus undercast. This picture was taken at 29,000 ft MSL (8.8 km), the highest altitude attained during this flight.

The  $6.63 \times 10^{-3} \text{ g m}^{-3}$  LWC value determined by the scattering probe at this time is greater than comparable scattering probe values for the other specific seven cases considered here. It is also larger than LWC contributions determined at this particular time by the cloud and precipitation probes.

The precipitation probe recorded only a small number of particles and those were in its smallest channel,  $400 \mu\text{m}$ . Since there was only one point that could be plotted a precipitation probe distribution of density-size is not graphed on Figure 13b—although a mean diameter and LWC are given. The  $400 \mu\text{m}$  bullet rosette crystals measured by the precipitation probe were computed to have mean diameters of  $175 \mu\text{m}$  when converted to equivalent volume droplets. This is the smallest size determined by this probe for any of the eight cases considered here.

The maximum in the cloud probe distribution near  $200\text{--}250 \mu\text{m}$  that was seen in several other cirrus cases is not apparent in Figure 13b. There is instead a gradual, discontinuous decrease of concentration with increased size as was seen in the denser clouds represented by Figures 7 and 8. The cloud probe LWC is also one of the lowest examined in this series aside from those of the cirrostratus cases given in Figures 7b and 8b.

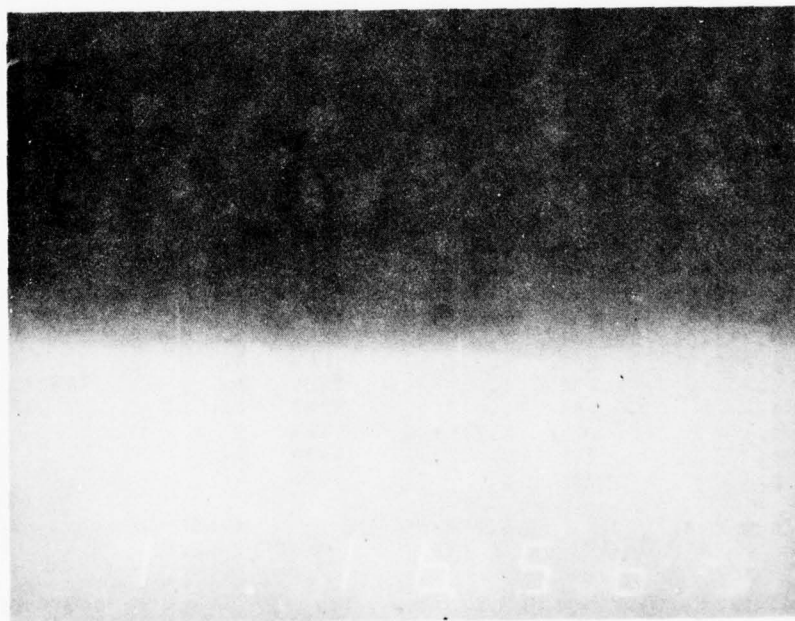
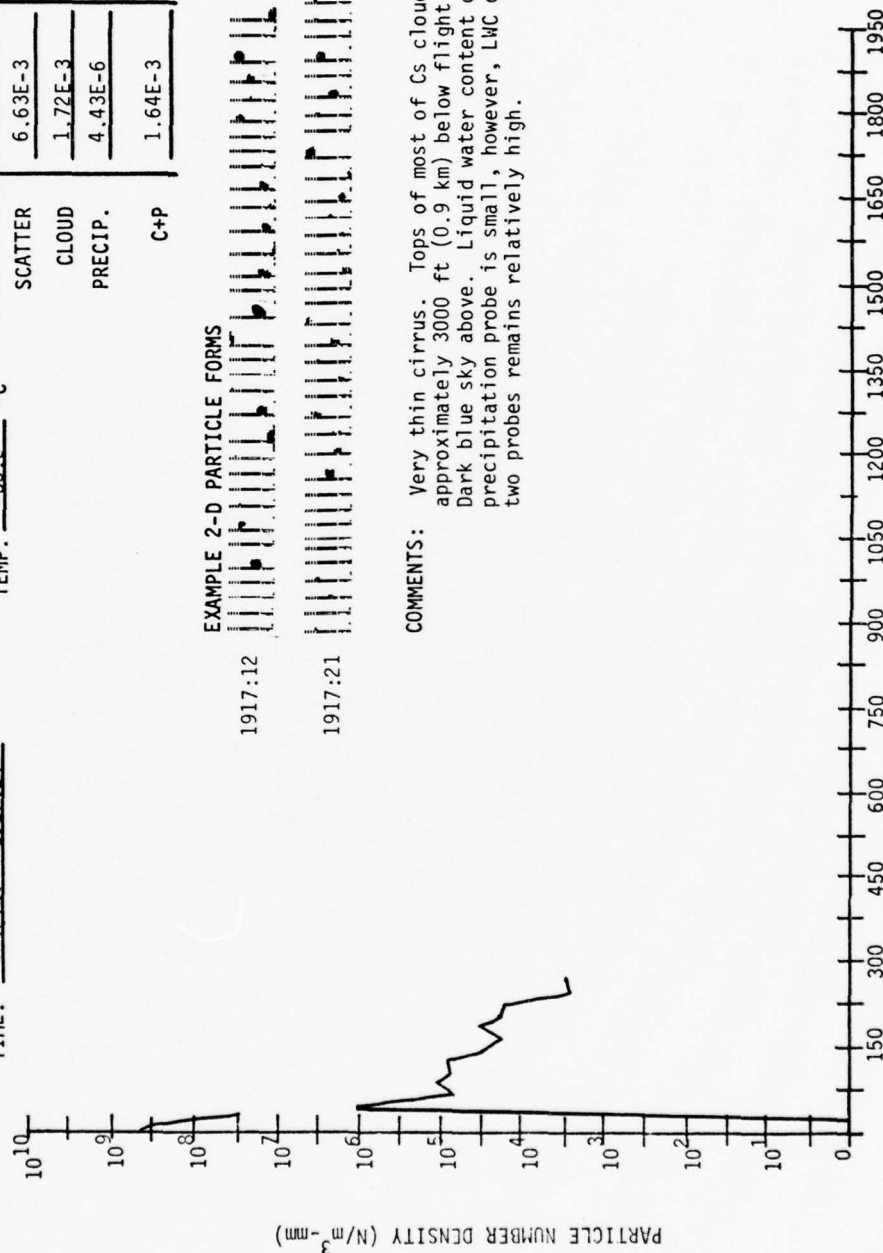


Figure 13a. Selected 16-mm Frame 1916:56, Thin Ci 8.8 km MSL, Temperature  $-35.5^{\circ}\text{C}$

DATE: 26 Feb 78  
TIME: 1917:10 - 1917:24

ALTITUDE 8.8 km  
TEMP. -35.5 °C

	LWC (g/m <sup>3</sup> )	DIA (μm)
SCATTER	6.63E-3	20
CLOUD	1.72E-3	66
PRECIP.	4.43E-6	175
C+P	1.64E-3	64



PARTICLE SIZE (μm)

#### EXAMPLE 2-D PARTICLE FORMS



COMMENTS: Very thin cirrus. Tops of most of Cs clouds are approximately 3000 ft (0.9 km) below flight altitude. Dark blue sky above. Liquid water content of precipitation probe is small, however, LWC of other two probes remains relatively high.

Figure 13b. Spectrometer Particle Data for Figure 13a

AFWL CIRRUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 15 SECOND AVERAGING  
INTERVAL START \*19:17:10\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	3.33E+03	26	0.	400	5.13E+00	316.4
4	3.68E+03	47	9.65E+05	706	0.	ALT (KM)
6	3.33E+03	67	6.10E+04	1011	0.	8.802
8	3.08E+03	87	1.04E+05	1316	0.	
10	2.41E+03	108	6.70E+04	1522	0.	TEMP (C)
12	1.91E+03	128	7.57E+04	1927	0.	-35.5
14	1.17E+03	148	2.67E+04	2233	0.	
16	1.81E+03	169	1.53E+04	2538	0.	DEWP (C)
18	1.40E+03	189	3.30E+04	2843	0.	
20	6.22E+07	209	1.60E+04	3149	0.	
22	4.40E+07	230	1.54E+04	3454	0.	TAS (M/S)
24	4.94E+07	250	2.44E+03	3760	0.	122.7
26	3.16E+07	271	2.75E+03	4065	0.	
28	3.61E+07	291	0.	4370	0.	
30	2.32E+07	311	0.	4676	0.	
LWC	6.63E-03		1.72E-03		4.43E-06	TOTALS
MED D	20		56		175	1.54E-03
						64

INTERVAL START \*19:17:25\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	1.24E+03	26	0.	400	8.18E+00	316.2
4	5.61E+03	47	1.13E+06	706	0.	ALT (KM)
6	6.60E+03	67	1.74E+05	1011	0.	8.815
8	5.79E+03	87	1.34E+05	1316	0.	
10	4.52E+03	108	3.52E+04	1522	0.	TEMP (C)
12	3.67E+03	128	5.73E+04	1927	0.	-35.4
14	2.19E+03	148	4.10E+04	2233	0.	
16	3.11E+03	169	1.01E+04	2538	0.	DEWP (C)
18	2.27E+03	189	1.64E+04	2843	0.	
20	1.03E+03	209	1.19E+04	3149	0.	
22	7.30E+07	230	4.39E+03	3454	0.	TAS (M/S)
24	5.82E+07	250	1.22E+04	3760	0.	122.5
26	4.63E+07	271	2.73E+03	4065	0.	
28	3.70E+07	291	0.	4370	0.	
30	2.17E+07	311	0.	4676	0.	
LWC	9.87E-03		1.70E-03		7.08E-06	TOTALS
MED D	18		61		175	1.49E-03
						53

Figure 13c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 13b and the Photo in Figure 13a

5.8 Example No. 8: 1924:04Z

Figure 14a shows a case of thin cirrus before the airplane at 29,000 ft MSL and a broad layer of cirrostratus beneath. The nose-camera movie film indicated the aircraft was passing in and out of thin cirrus tops frequently at this time so that LWC and particle size values changed rapidly.

The liquid water content determined by the cloud probe (in Figures 14b and 14c) is the greatest of any of the eight cases discussed here; however, the range of the eight values was relatively small, varying between  $0.78 \times 10^{-3} \text{ g m}^{-3}$  in Figure 7b and  $7.35 \times 10^{-3}$  in Figure 14b.

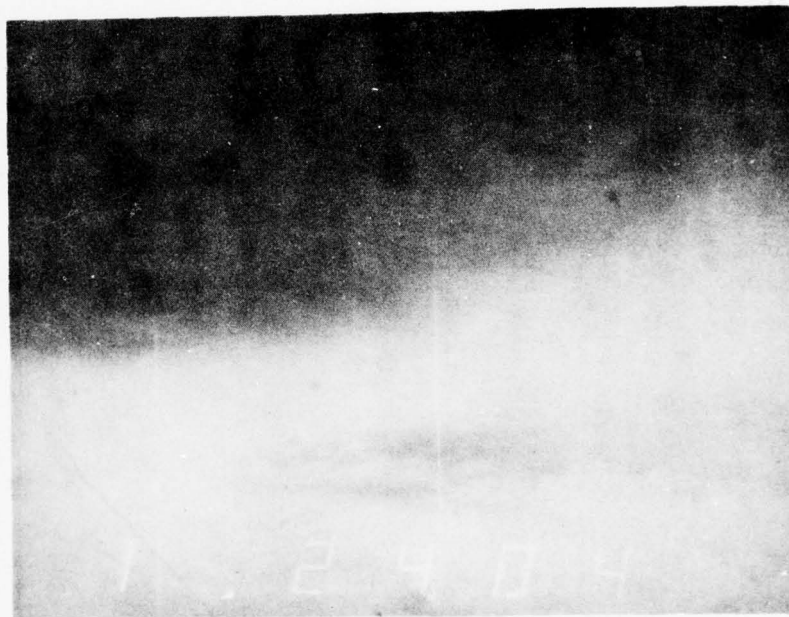


Figure 14a. Selected 16-mm Frame 1924:04, Thin Ci 8.8 km MSL, Temperature  $-36.1^{\circ}\text{C}$

DATE: 26 Feb 78  
 TIME: 1924:10 - 1924:24

ALTITUDE 8.8 km  
 TEMP. -36.1 °C

	LWC (G/M <sup>3</sup> )	DIA (μm)
SCATTER	2.53 E-3	21
CLOUD	7.35 E-3	107
PRECIP.	4.33 E-4	178
C+P	3.82 E-3	93

# EXAMPLE 2-D PARTICLE FORMS



COMMENTS: In and out of thin cirrus. Cloud tops are about 500 ft (150M) above flight level. The C+P DIA (diameter) value for the ensuing 15 second record dropped to 43μm from 93μm (see Fig. 14c).

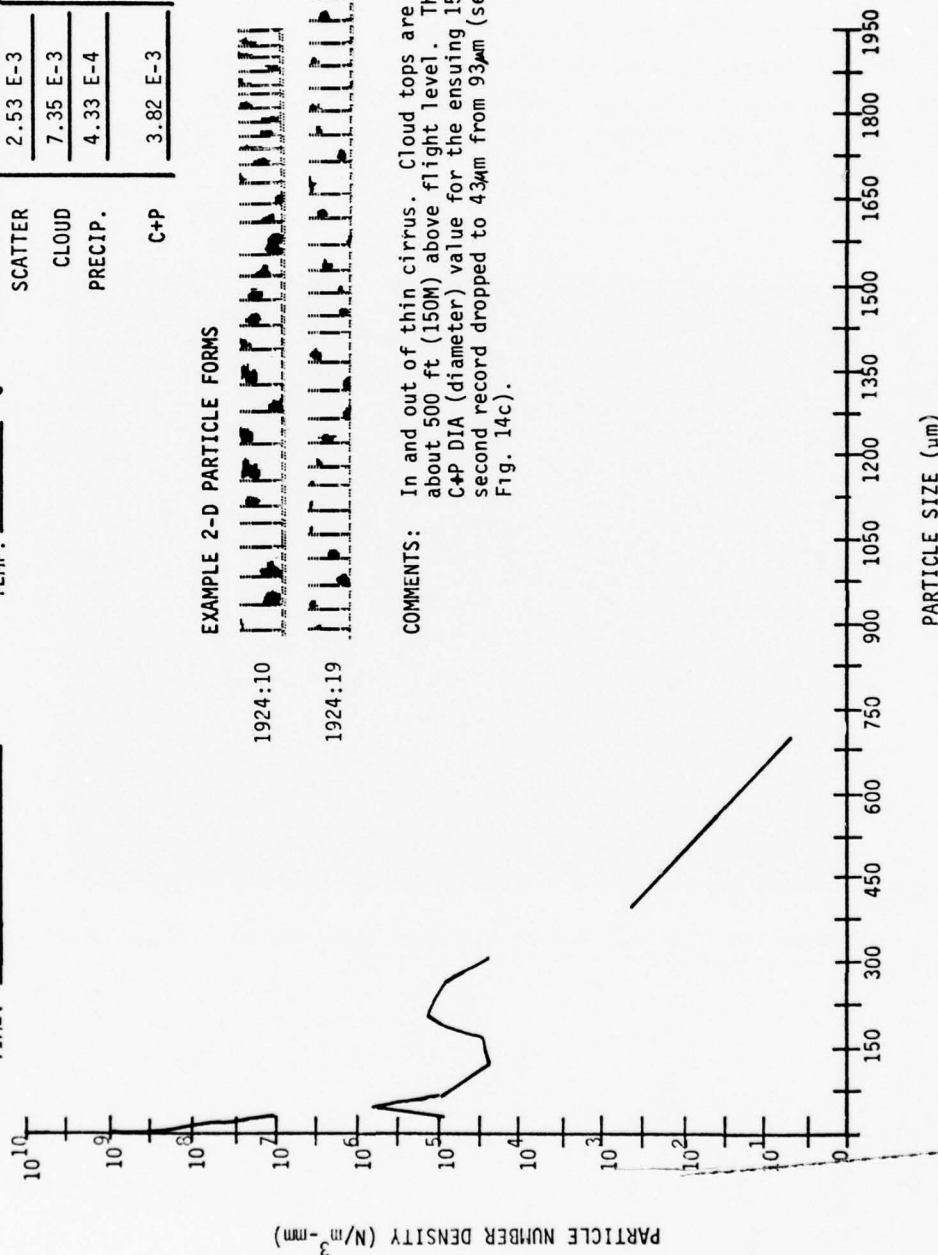


Figure 14b. Spectrometer Particle Data for Figure 14a



AFWL CIRRUS STUDY BY AFG

FLIGHT E79-03 ON 26 FEB 78 15 SECOND AVERAGING

INTERVAL START \*19:24:10\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.08E+03	26	6.95E+04	400	4.78E+02	315.6
4	1.95E+03	47	6.01E+05	706	4.23E+00	ALT (KM)
6	1.41E+03	67	9.55E+04	1011	0.	8.820
8	1.11E+04	87	5.09E+04	1316	0.	
10	8.31E+07	108	3.46E+04	1522	0.	TEMP (C)
12	7.29E+07	128	2.06E+04	1927	0.	-36.1
14	3.99E+07	148	2.43E+04	2233	0.	
16	6.99E+07	169	2.50E+04	2538	0.	DEWP (C)
18	4.18E+07	189	7.02E+04	2943	0.	
20	2.19E+07	209	1.22E+05	3149	0.	
22	1.84E+07	230	1.08E+05	3454	0.	TAS (M/S)
24	1.46E+07	250	8.88E+04	3760	0.	124.1
26	1.36E+07	271	7.30E+04	4065	0.	
28	1.94E+07	291	3.71E+04	4370	0.	
30	8.26E+05	311	2.16E+04	4676	0.	
LWC	2.53E-03		7.35E-03		4.33E-04	TOTALS
MED D	21		107		178	3.82E-03
						93

INTERVAL START \*19:24:25\*

PARTICLE SIZE DISTRIBUTIONS (NUMBER/M<sup>3</sup>-MM)

TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.81E+07	26	1.39E+05	400	1.17E+02	315.3
4	4.28E+03	47	3.87E+06	706	3.18E+00	ALT (KM)
6	5.98E+08	67	5.93E+05	1111	0.	8.825
8	5.25E+03	87	3.23E+05	1316	0.	
10	4.08E+08	108	1.22E+05	1522	0.	TEMP (C)
12	3.53E+03	128	6.19E+04	1927	0.	-36.0
14	1.96E+08	148	3.46E+04	2233	0.	
16	3.04E+08	169	1.17E+04	2538	0.	DEWP (C)
18	2.51E+03	189	2.71E+04	2943	0.	
20	1.34E+03	209	1.97E+04	3149	0.	
22	1.07E+03	230	8.68E+03	3454	0.	TAS (M/S)
24	8.15E+07	250	1.21E+04	3760	0.	123.7
26	1.01E+08	271	2.44E+04	4065	0.	
28	8.64E+07	291	6.21E+03	4370	0.	
30	6.15E+07	311	3.63E+03	4676	0.	
LWC	1.40E-02		4.38E-03		1.16E-04	TOTALS
MED D	22		49		185	3.65E-03
						43

Figure 14c. Particle Size Distribution Averages for Two Consecutive 15-sec Intervals. The Upper One Corresponds to the Plotted Values on Figure 14b and the Photo in Figure 14a

## 6. EXAMPLES OF LONGER PERIOD PARTICLE DISTRIBUTIONS

The cloud particle data in Figures 7b and 7c through 14b and 14c are averages for 15-sec intervals during the *sampling flight*. In Figure 15 some examples are given of particle distributions averaged over longer periods, from 1 to 5-1/2 minutes. The time intervals selected were based on the length of time a given type of cloud was being sampled. That is, periods were sought when sampling was continuous through the same general kind of cloud conditions, for example, thin cirrus near the tops. The periods chosen were primarily based on review of the nose-camera color film and of the mission director's flight log.

It was desired to have data averages over even longer intervals than those in Figure 15, however, cirriform cloud conditions were quite variable on the day that sampling was performed. For this reason the sampling aircraft was almost continuously moving from one type of cloud to another, and was not in homogeneous cloud or non-cloud conditions for more than a few minutes at a time.

Several of the Figure 15 plots were made over time periods that encompass some of the shorter period examples shown in Figures 7 through 14. In these cases longer period particle distributions may be compared with those computed for 15-sec periods. For the examples in Figure 15 more detailed data listings of particle concentration as a function of particle size are given in Appendix A.

The specific type of cloud condition that the Figure 15 plots represent are given on each diagram. In general, the greatest particle concentrations were found in the various types of cirrostratus shown in Figures 15a, b, c, and d. The e diagram represents a time when the aircraft was flying in a nearly cloud-free "blue sky", however, even here small numbers of cloud- and precipitation-sized particles were recorded.

Figures 15f, g, and h represent thin or very thin cirrus situations as well as could be determined by the eye. The spectrometers indicated different particle distributions in each case. The f diagram differs from h in that it has a small maximum at about  $200\ \mu\text{m}$ . Additionally, the h figure indicates precipitation-sized particles as large as  $700\ \mu\text{m}$  which are not reflected in f. The Figure 15g differs from both f and h in having a significant peak in the distribution near  $300\ \mu\text{m}$  and a general decrease in concentration from that point as particles decrease in size.

The maximum in the concentration curves near 250 to  $300\ \mu\text{m}$ , that was mentioned in the previous section, is also apparent to some extent in most of the Figure 15 plots.

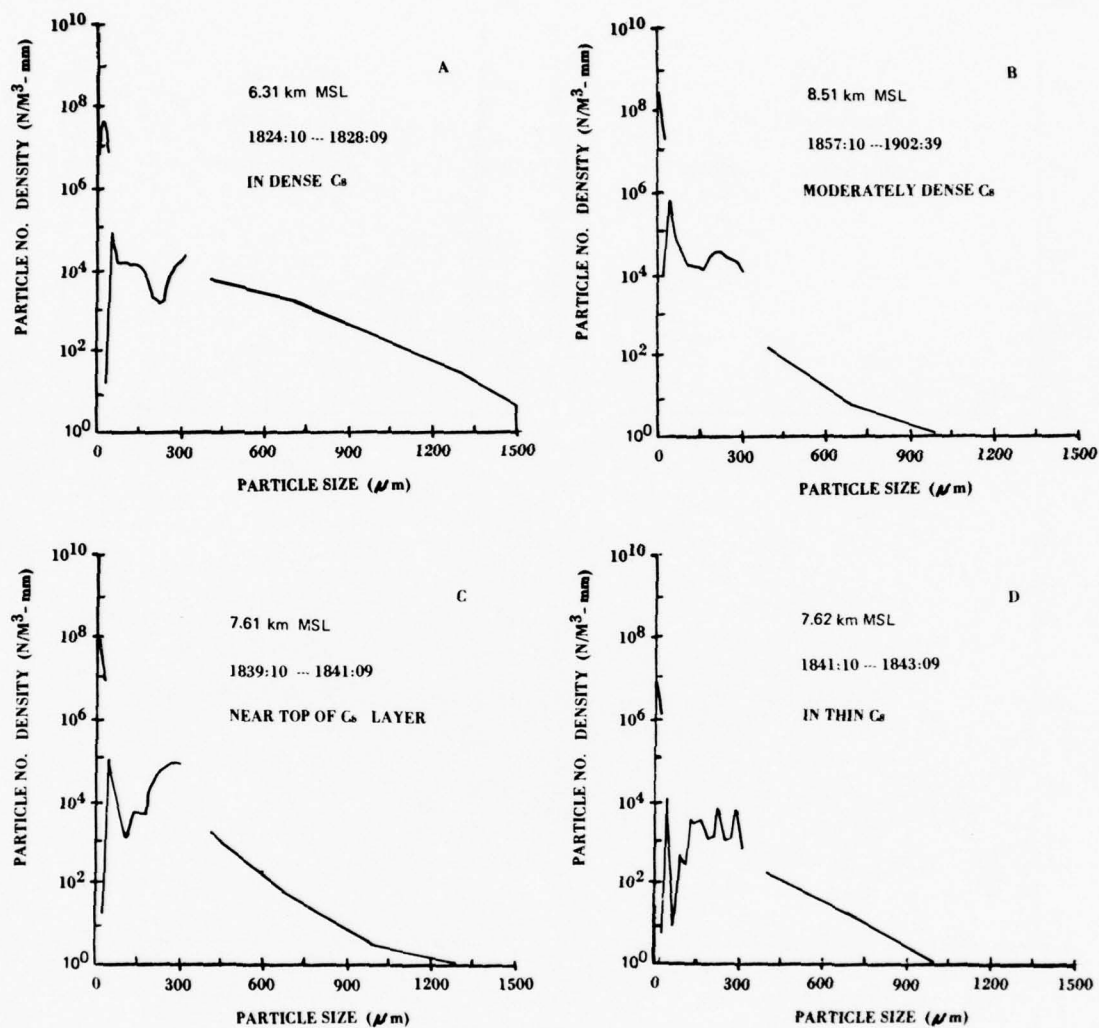


Figure 15. Particle Concentration as Function of Size for Different Cirriform Cloud Types Sampled on 26 February 1978. Data are averaged over the varying time intervals indicated

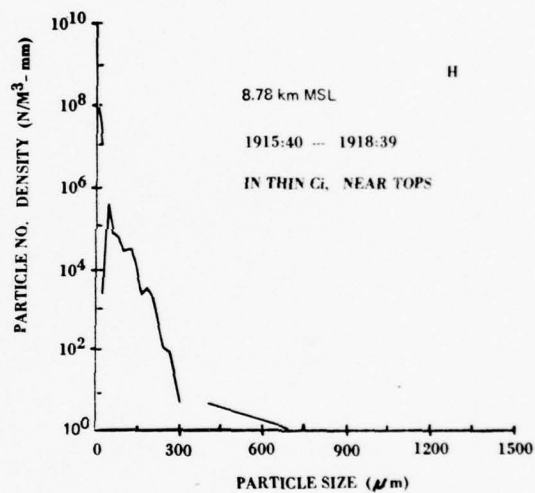
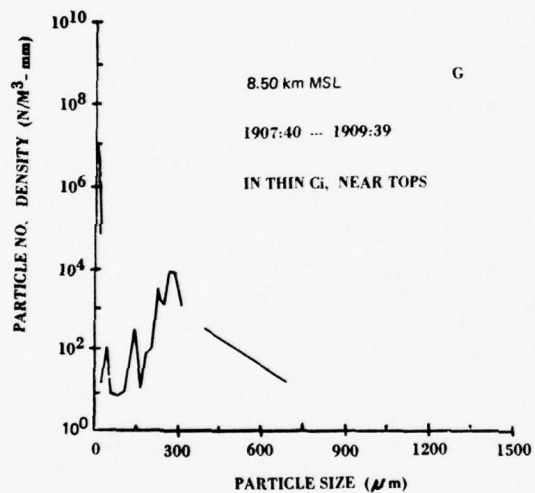
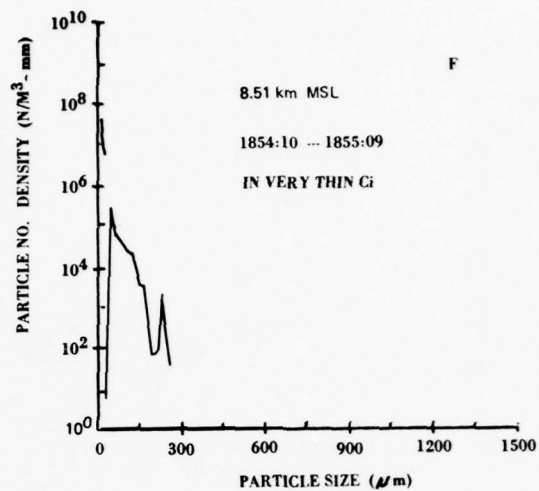
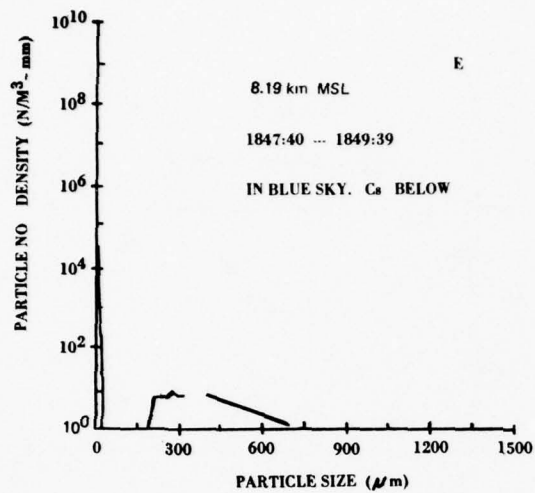


Figure 15. (Cont)

## 7. CONCLUDING COMMENTS

The MC-130E flight of 26 February 1978 in the Albuquerque, New Mexico area was successful in that a variety of cirrus types was available for sampling and the aircraft instrumentation, aside from the particle replicator and dew point equipment, was all operative.

Although our primary emphasis was on sampling relatively thin cirriform clouds, an extensive, more dense cirrostratus cloud layer was also sampled as the aircraft ascended to the cirrus above it. The data in this report, which were recorded during the approximately one and one-half hour flight at cirrus altitudes, will permit various comparisons of particle concentrations to be made between, for example, cirrostratus bases and tops or thicker uniform cirrostratus and fibrous cirrus.

There was a large variation in liquid water content during the flight as the aircraft passed in and out of cirriform clouds. For a short time before the aircraft ascended into the visible Cs cloud some particles as large as  $1700\text{ }\mu\text{m}$  were recorded. This was similar to the situation of rain falling to the ground from a cloud above while the surface visibility remains relatively good. The lower levels of the cirrostratus cloud had few particles in the  $25$  to  $300\text{ }\mu\text{m}$  range that are recorded by the PMS cloud probe. There was, however, a greater population of larger particles up to  $2000\text{ }\mu\text{m}$  in the cirrostratus.

In the cirrus clouds up to  $29,000\text{ ft}$  ( $8.8\text{ km}$ ) the highest concentration of particles was almost always in the smaller sizes measured by the scattering probe ( $2 - 30\text{ }\mu\text{m}$ ). This is in agreement with the results of Heymsfield<sup>3</sup> who studied 13 cirrus cases. With respect to mass or liquid water content, however, the scattering probe and cloud probe ( $26 - 311\text{ }\mu\text{m}$ ) measurements often resulted in approximately equal amounts with the cloud probe becoming dominant with denser clouds. The precipitation probe occasionally recorded a few particles as large as  $1500\text{ }\mu\text{m}$ , but liquid water computations from its measurements were usually half those of the cloud probe or less. Since the cirriform particle spectra frequently extended from  $2\text{ }\mu\text{m}$  or less to sizes in excess of  $2\text{ mm}$  the use of all three spectrometer probes was justified on this mission.

Liquid water content measurements ranged from approximately  $1 \times 10^{-5}$  to  $1 \times 10^{-4}\text{ g m}^{-3}$  in some of the thinner cirrus clouds, to  $2$  to  $4 \times 10^{-2}\text{ g m}^{-3}$  in the base of cirrostratus and in the more dense cirrus. Past measurements in cirrus by Heymsfield and Knollenberg<sup>5</sup> and by Hobbs et al<sup>6</sup> have derived slightly higher values of LWC (or ice water content). Heymsfield and Knollenberg, however, studied primarily cirrus generating cells, and most of the measurements by Hobbs et al were made below  $23,000\text{ ft}$  ( $7.0\text{ km}$ ). According to a later study by Heymsfield<sup>3</sup>, larger ice water content values are frequently encountered in the lowest portions of



cirrus clouds. This does not totally explain the difference in water content values in cirrus, but those reported here were determined in a manner that has previously permitted close correlations with radar derived reflectivity values (for example, Berthel<sup>9</sup> and Plank<sup>10</sup>).

Computer printouts of particle distributions as a function of size are provided in the two appendixes for the time sampling was being made at cirriform cloud altitudes.

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## Appendix A

### Average Particle Distributions for Varying Time Periods

Particle concentration data are given in the following pages for some of the types of cirriform clouds that were sampled on 26 February 1978 in the Albuquerque area. The varying time periods over which the data are averaged were selected to be as long as possible while sampling a relatively homogeneous cloud type, for example, dense cirrostratus or thin cirrus. Each data listing (two per page) corresponds to one of the plots of data shown in Figure 15 in the text. The specific one is indicated near each listing.

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Average particle distribution (No. / m<sup>3</sup> --mm) for the 240-sec period beginning at 1824:10Z. Data correspond to Figure 15A in text. In dense cirrostratus.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.99E+06	26	1.01E+04	400	6.22E+03	451.8
4	1.28E+07	47	9.39E+04	706	1.86E+03	ALT (KM)
6	1.67E+07	67	1.86E+04	1011	2.94E+02	6.315
8	2.80E+07	87	1.78E+04	1316	4.90E+01	
10	4.40E+07	108	1.56E+04	1622	7.86E+00	TEMP (C)
12	4.66E+07	128	1.55E+04	1927	3.62E+00	-22.3
14	3.74E+07	148	1.27E+04	2233	1.42E+00	
16	3.53E+07	169	6.74E+03	2538	1.09E-01	FROSTPOINT
18	2.78E+07	189	6.13E+03	2843	1.17E-01	
20	1.74E+07	209	4.82E+03	3149	0.	
22	1.59E+07	230	5.17E+03	3454	0.	TAS (M/S)
24	1.19E+07	250	8.66E+03	3760	0.	107.0
26	1.02E+07	271	1.52E+04	4065	0.	
28	9.03E+06	291	2.07E+04	4370	0.	
30	7.23E+06	311	2.52E+04	4676	0.	
						TOTALS
LWC	1.67E-03		1.91E-03		2.09E-02	2.12E-02
WED D	22		126		319	316

Average particle distribution (No. / m<sup>3</sup> --mm) for the 330-sec period beginning at 1857:10Z. Data correspond to Figure 15B in text. In moderately dense cirrostratus

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.18E+08	23	6.06E+04	350	3.16E+02	330.3
4	3.88E+08	43	8.07E+05	647	1.28E+01	ALT (KM)
6	5.78E+08	62	7.76E+04	944	3.46E-01	8.910
8	4.88E+08	82	5.11E+04	1241	0.	
10	3.56E+08	102	2.26E+04	1538	0.	TEMP (C)
12	2.77E+08	122	2.67E+04	1935	0.	-30.6
14	1.64E+08	142	2.75E+04	2132	0.	
16	2.01E+08	161	2.46E+04	2429	0.	FROSTPOINT
18	1.42E+08	181	4.58E+04	2726	0.	
20	6.67E+07	201	4.93E+04	3023	0.	
22	5.83E+07	221	4.19E+04	3820	0.	TAS (M/S)
24	3.63E+07	241	2.99E+04	3617	0.	123.5
26	3.52E+07	260	2.79E+04	3914	0.	
28	2.93E+07	280	2.21E+04	4211	0.	
30	1.88E+07	300	1.38E+04	4508	0.	
						TOTALS
LWC	8.99E-03		3.77E-03		3.59E-04	2.38E-03
WED D	19		72		212	69

Average particle distribution (No. /m<sup>3</sup>--mm) for the 120-sec period beginning at 1839:10Z. Data correspond to Figure 15C in text. Near top of cirrostratus layer.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.83E+07	26	1.86E+04	400	2.25E+03	376.6
4	1.25E+08	47	1.24E+05	706	1.01E+02	ALT (KM)
6	1.12E+08	67	2.05E+04	1011	4.16E+00	7.607
8	8.83E+07	87	8.18E+03	1316	1.56E-01	
10	7.25E+07	108	1.06E+04	1622	0.	TEMP (C)
12	5.49E+07	128	6.51E+03	1927	0.	-29.7
14	3.65E+07	148	5.38E+03	2233	0.	
16	3.98E+07	169	4.98E+03	2538	0.	FROSTPOINT
18	2.92E+07	189	1.63E+04	2843	0.	
20	1.90E+07	209	3.37E+04	3149	0.	
22	1.37E+07	230	6.09E+04	3454	0.	TAS (M/S)
24	1.20E+07	250	7.50E+04	3750	0.	116.6
26	1.22E+07	271	9.76E+04	4055	0.	
28	1.03E+07	291	9.82E+04	4370	0.	
30	8.75E+06	311	8.74E+04	4676	0.	
						TOTALS
LWC	1.92E-03		8.55E-03		2.48E-03	3.70E-03
MED D	22		124		194	152

Average particle distribution (No. /m<sup>3</sup>--mm) for the 330-sec period beginning at 1841:10Z. Data correspond to Figure 15D in text. In thin cirrostratus.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.13E+08	26	0.	400	2.70E+02	375.9
4	2.70E+07	47	1.24E+04	706	2.88E+01	ALT (KM)
6	2.07E+07	67	1.16E+03	1011	1.52E-01	7.620
8	1.62E+07	87	3.47E+03	1316	1.59E-01	
10	1.31E+07	108	1.42E+03	1622	0.	TEMP (C)
12	1.10E+07	128	4.18E+03	1927	0.	-30.2
14	6.75E+06	148	4.70E+03	2233	0.	
16	6.89E+06	169	5.69E+03	2538	0.	FROSTPOINT
18	6.69E+06	189	1.45E+04	2843	0.	
20	3.51E+06	209	1.78E+04	3149	0.	
22	3.31E+06	230	1.60E+04	3454	0.	TAS (M/S)
24	2.26E+06	250	1.08E+04	3750	0.	114.5
26	2.73E+06	271	1.07E+04	4055	0.	
28	2.25E+06	291	8.43E+03	4370	0.	
30	1.59E+06	311	4.93E+03	4676	0.	
						TOTALS
LWC	3.82E-04		1.15E-03		3.77E-04	8.66E-04
MED D	21		110		216	102



Average particle distribution (No. /m<sup>3</sup>--mm) for the 120-sec period beginning at 1847:40Z. Data correspond to Figure 15E in text. In blue sky with cirrostratus below.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						346.8
2	1.49E+09	26	0.	400	9.03E+00	
4	1.28E+06	47	0.	706	2.80E-01	ALT (KM)
5	4.48E+05	67	0.	1011	0.	8.194
8	5.10E+05	87	0.	1316	0.	
10	5.73E+05	108	0.	1522	0.	TEMP (C)
12	5.06E+05	128	0.	1927	0.	-32.2
14	2.54E+05	148	0.	2233	0.	
16	1.27E+05	169	0.	2538	0.	FROSTPOINT
18	6.81E+04	189	0.	2843	0.	
20	0.	209	0.	3149	0.	
22	0.	230	2.81E+02	3454	0.	TAS (M/S)
24	1.91E+05	250	3.12E+02	3760	0.	117.8
26	0.	271	7.01E+02	4065	0.	
28	0.	291	4.01E+02	4370	0.	
30	0.	311	0.	4676	0.	
						TOTALS
LWC	1.89E-05		2.89E-05		9.14E-06	1.22E-05
MED D	2		119		186	160

Average particle distribution (No. /m<sup>3</sup>--mm) for the 60-sec period beginning at 1854:10Z. Data correspond to Figure 15F in text. In very thin cirrus.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
						330.1
2	7.54E+08	26	0.	400	1.03E+00	
4	1.53E+08	47	4.04E+05	706	0.	ALT (KM)
6	2.12E+08	67	6.54E+04	1011	0.	8.515
8	1.92E+08	87	4.54E+04	1316	0.	
10	1.49E+08	108	2.92E+04	1622	0.	TEMP (C)
12	1.12E+08	128	2.29E+04	1927	0.	-33.8
14	7.55E+07	148	7.73E+03	2233	0.	
16	9.68E+07	169	5.52E+03	2538	0.	FROSTPOINT
18	5.87E+07	189	2.75E+03	2843	0.	
20	2.74E+07	209	3.51E+03	3149	0.	
22	1.74E+07	230	3.30E+03	3454	0.	TAS (M/S)
24	1.23E+07	250	6.13E+02	3760	0.	122.1
26	1.06E+07	271	0.	4065	0.	
28	9.63E+06	291	0.	4370	0.	
30	6.51E+06	311	0.	4676	0.	
						TOTALS
LWC	2.70E-03		5.54E-04		8.89E-07	5.46E-04
MED D	18		54		175	94

Average particle distribution (No./m<sup>3</sup>--mm) for the 120-sec period beginning at 1907:40Z. Data correspond to Figure 15G in text. In thin cirrus, near tops.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	
						P (MM)
2	2.09E+09	26	1.78E+04	400	4.95E+02	330.6
4	4.32E+07	47	9.12E+03	706	2.17E+01	ALT (KM)
5	2.41E+07	67	1.08E+03	1011	0.	8.504
8	1.75E+07	87	6.47E+02	1316	0.	
10	1.46E+07	108	1.35E+03	1622	0.	TEMP (C)
12	9.46E+06	128	1.66E+03	1927	0.	-33.5
14	6.60E+06	148	4.18E+03	2233	0.	
16	8.20E+06	169	8.04E+03	2538	0.	FROSTPOINT
18	5.74E+06	189	7.47E+03	2843	0.	
20	3.77E+06	209	8.63E+03	3149	0.	
22	3.14E+06	230	1.03E+04	3454	0.	TAS (M/S)
24	2.10E+06	250	1.04E+04	3760	0.	122.5
26	2.34E+06	271	1.30E+04	4065	0.	
28	1.85E+06	291	1.17E+04	4370	0.	
30	1.54E+06	311	1.04E+04	4676	0.	
						TOTALS
LWC	3.83E-04		1.20E-03		5.31E-04	8.11E-04
MED D	21		120		191	147

Average particle distribution (No./m<sup>3</sup>--mm) for the 180-sec period beginning at 1915:40Z. Data correspond to Figure 15H in text. In thin cirrus, near tops.

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	
						P (MM)
2	1.24E+09	26	7.66E+04	400	3.52E+01	317.5
4	2.17E+08	47	6.17E+05	706	5.44E-01	ALT (KM)
6	2.00E+08	67	8.42E+04	1011	0.	8.779
8	1.78E+08	87	8.14E+04	1316	0.	
10	1.37E+08	108	4.15E+04	1622	0.	TEMP (C)
12	1.11E+08	128	4.14E+04	1927	0.	-35.4
14	6.91E+07	148	2.32E+04	2233	0.	
16	9.70E+07	169	1.28E+04	2538	0.	FROSTPOINT
18	7.57E+07	189	2.13E+04	2843	0.	
20	3.77E+07	209	1.51E+04	3149	0.	
22	2.63E+07	230	1.29E+04	3454	0.	TAS (M/S)
24	2.39E+07	250	9.04E+03	3760	0.	122.4
26	2.04E+07	271	8.33E+03	4065	0.	
28	1.91E+07	291	4.23E+03	4370	0.	
30	1.20E+07	311	1.85E+03	4676	0.	
						TOTALS
LWC	3.72E-03		1.62E-03		3.30E-05	1.24E-03
MED D	20		81		181	67

## Appendix B

### Average Particle Distributions for 30-Second Periods

The following pages provide cloud particle concentration data as a function of particle size for the time on 26 February 1978 when the sampling aircraft was between approximately 16,000 ft (4.9 km) and 29,000 ft (8.8 km) MSL. Varying amounts of cirrostratus were sampled up to about 26,000 ft (7.9 km). Above that the aircraft was primarily in and out of cirrus clouds. There was no extensive cloudiness above 29,000 ft MSL.

The printouts consist of data averages for consecutive 30-sec periods during the flight. For description of the printout format see the first AFGL study in this series by Varley.<sup>1</sup>

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING									
INTERVAL START 210210Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	P (MR)
2	2.49E+06	26	0.	0.	545.2	2	1.55E+06	26	0.
4	0.	49	0.	5.40E-01	ALT (KM)	4	1.39E+06	49	0.
6	0.	72	0.	4.929		6	1.11E+06	72	0.
8	0.	95	0.			8	0.31E+06	95	0.
10	0.	118	0.		TEMP (C)	10	2.77E+05	118	1.74E+03
12	2.82E+05	141	0.		-12.1	12	5.55E+05	141	0.
14	0.	164	0.			14	0.	164	0.
16	0.	187	0.		PRECIPPOINT	16	2.74E+05	187	8.36E+02
18	0.	210	0.			18	5.57E+05	210	0.
20	0.	233	0.			20	0.	233	0.
22	0.	256	0.		TAS (M/S)	22	2.75E+05	256	0.
24	0.	279	0.		109.0	24	2.80E+05	279	0.
26	0.	302	0.			26	0.	302	0.
28	0.	325	0.			28	2.75E+05	325	0.
30	0.	348	0.			30	0.	348	0.
LWC	5.12E-07	0.	0.	2.73E-06	TOTALS	LWC	2.01E-05	2.10E-05	TOTALS
MED	14	0	0	303		MED	0	104	
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING									
INTERVAL START 210210Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	P (MR)
2	4.53E+06	26	0.	1.14E+01	533.4	2	3.06E+06	26	0.
4	0.	49	0.	1.85E+01	ALT (KM)	4	7.25E+06	49	9.22E+03
6	0.	72	0.	2.28E+00	5.092	6	6.14E+06	72	0.
8	0.	95	0.	6.05E-01		8	5.02E+06	95	0.
10	0.	118	0.		TEMP (C)	10	4.18E+06	118	0.
12	0.	141	0.		-13.2	12	2.78E+06	141	1.30E+03
14	0.	164	0.			14	3.05E+06	164	1.02E+03
16	0.	187	0.		PRECIPPOINT	16	2.79E+06	187	0.
18	2.84E+05	210	0.			18	2.50E+06	210	9.17E+02
20	0.	233	0.			20	5.48E+05	233	0.
22	0.	256	0.		TAS (M/S)	22	8.25E+05	256	0.
24	0.	279	0.		106.6	24	1.67E+06	279	0.
26	0.	302	0.			26	8.25E+05	302	0.
28	0.	325	0.			28	8.26E+05	325	0.
30	0.	348	0.			30	5.58E+05	348	0.
LWC	1.77E-06	0.	0	1.45E-04	TOTALS	LWC	1.79E-04	4.61E-05	TOTALS
MED	17	0	0	314		MED	0	94	
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING									
INTERVAL START 210210Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	P (MR)
2	1.55E+06	26	0.	7.01E+01	526.3	2	1.55E+06	26	0.
4	1.39E+06	49	0.	7.08E+01	ALT (KM)	4	1.39E+06	49	0.
6	1.11E+06	72	0.	1.95E+01	5.193	6	1.11E+06	72	0.
8	0.31E+06	95	0.	1.77E+03		8	0.31E+06	95	0.
10	2.77E+05	118	1.74E+03		TEMP (C)	10	2.77E+05	118	1.74E+03
12	5.55E+05	141	0.		-13.9	12	5.55E+05	141	0.
14	0.	164	0.			14	0.	164	0.
16	2.74E+05	187	8.36E+02		PRECIPPOINT	16	2.74E+05	187	8.36E+02
18	5.57E+05	210	0.			18	5.57E+05	210	0.
20	0.	233	0.			20	0.	233	0.
22	2.75E+05	256	0.		TAS (M/S)	22	2.75E+05	256	0.
24	2.80E+05	279	0.		109.0	24	2.80E+05	279	0.
26	0.	302	0.			26	0.	302	0.
28	2.75E+05	325	0.			28	2.75E+05	325	0.
30	0.	348	0.			30	0.	348	0.
LWC	2.01E-05	0.	2.10E-05		TOTALS	LWC	2.01E-05	2.10E-05	TOTALS
MED	0	104				MED	0	104	

AFML CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING										
INTERVAL START 18122100										
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)										
TYPE: SNOW										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MR)	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	
2	1.10E+06	26	0.	334	9.05E+02	510.4	2	1.08E+06	25	0.
4	3.59E+05	49	0.	743	3.88E+02	ALT (KM)	4	4.23E+06	47	4.82E+04
6	3.86E+05	72	4.31E+03	1030	4.84E+01	5.421	6	5.21E+06	67	0.
8	7.59E+05	75	0.	1433	8.20E+00		8	1.10E+07	57	2.96E+03
10	4.14E+06	114	1.74E+03	1720	1.85E+00	TEMP (C)	10	1.15E+07	104	2.02E+03
12	5.52E+06	141	0.	2122	0.	-15.7	12	1.10E+07	128	3.00E+03
14	4.96E+06	164	0.	2468	0.	FROSTPOINT	14	9.29E+06	144	3.52E+03
16	4.58E+06	197	1.88E+03	2813	0.		16	9.20E+06	159	2.88E+03
18	3.31E+06	210	9.06E+02	3158	0.		18	9.22E+06	159	2.09E+03
20	2.20E+06	233	0.	3503	0.		20	8.19E+06	209	2.27E+03
22	2.48E+06	256	0.	3848	0.	TAS (M/S)	22	5.35E+06	239	7.51E+03
24	1.10E+06	279	0.	4193	0.	109.5	24	4.78E+06	250	5.51E+03
26	5.50E+05	302	2.71E+03	4518	0.		26	3.66E+06	271	4.71E+03
28	1.89E+06	325	3.10E+03	4883	0.		28	2.54E+06	291	4.92E+03
30	1.10E+06	344	1.81E+03	5228	0.		30	1.13E+06	311	5.27E+03
TOTALS							TOTALS			
LWC	2.17E-04	4.75E-04	154	3.91E-03	291	3.97E-03	LWC	4.93E-04	7.07E-04	
MEQ 0	22	291	154	291	291	290	MEQ 0	22	349	

AFML CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING										
INTERVAL START 18122100										
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)										
TYPE: SNOW										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MR)	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	
2	8.19E+05	26	0.	430	9.18E+02	502.2	2	2.22E+06	25	0.
4	2.48E+06	47	0.	706	4.03E+02	ALT (KM)	4	5.26E+06	47	4.15E+04
6	3.28E+06	67	4.24E+03	1011	1.06E+02	5.540	6	6.37E+06	57	1.47E+04
8	4.87E+06	97	0.	1316	2.09E+01		8	1.29E+07	87	2.92E+03
10	7.18E+06	104	3.70E+03	1622	1.84E+00	TEMP (C)	10	1.91E+07	104	5.94E+03
12	4.88E+06	128	0.	1927	1.59E+00	-16.9	12	1.80E+07	128	1.88E+03
14	4.68E+06	141	0.	2233	0.	FROSTPOINT	14	1.14E+07	144	1.16E+03
16	3.58E+06	164	0.	2538	0.		16	1.38E+07	159	0.
18	6.07E+06	189	0.	2843	0.		18	8.32E+06	199	2.06E+03
20	5.88E+05	209	0.	3149	0.	TAS (M/S)	20	8.59E+06	209	3.55E+03
22	1.36E+06	230	1.08E+03	3454	0.	110.1	22	6.10E+06	239	3.59E+03
24	1.82E+06	250	2.78E+03	3760	0.		24	6.37E+06	250	5.57E+03
26	2.74E+06	271	8.39E+03	4065	0.		26	4.43E+06	271	1.54E+04
28	5.58E+05	291	0.	4370	0.		28	1.95E+06	291	1.56E+04
30	8.16E+05	311	5.62E+03	4676	0.		30	4.19E+06	311	1.44E+04
TOTALS							TOTALS			
LWC	2.19E-04	6.76E-04	159	4.94E-03	317	4.99E-03	LWC	6.80E-04	1.23E-03	
MEQ 0	22	317	159	317	317	317	MEQ 0	22	345	



AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING												
INTERVAL START 18124100												
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: GULL-ROSE												
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	P (MB)	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	P (MB)	
2	3.74E+06	76	0.	400	4.23E+03	473.6	2	3.98E+06	76	0.	5.50E+03	
4	7.79E+06	47	8.60E+04	706	1.86E+03	ALT (KM)	4	1.20E+07	47	6.42E+04	706	2.35E+03
6	1.06E+07	67	1.01E+04	1011	1.49E+02	5.967	6	1.59E+07	67	1.01E+04	1011	4.78E+02
8	1.61E+07	37	1.21E+04	1316	6.67E+01		8	2.27E+07	37	2.40E+04	1316	9.50E+01
10	2.32E+07	108	8.20E+03	1622	1.16E+01	TEMP (C)	10	4.30E+07	108	8.12E+03	1622	1.73E+01
12	3.01E+07	128	1.21E+04	1927	4.60E+00	-20.1	12	6.57E+07	128	1.36E+04	1927	1.22E+01
14	2.24E+07	148	1.43E+04	2233	1.64E+00		14	3.62E+07	148	7.11E+03	2233	4.65E+00
16	2.52E+07	169	7.94E+03	2538	6.77E-01	FROSTPOINT	16	2.92E+07	169	3.40E+03	2538	0.
18	1.52E+07	199	0.	2843	0.		18	2.71E+07	189	2.09E+03	2843	0.
20	1.30E+07	209	0.	3149	0.		20	1.57E+07	209	3.40E+03	3149	0.
22	1.66E+07	230	2.55E+03	3454	0.	TAS (M/S)	22	1.40E+07	230	3.79E+03	3454	0.
24	8.80E+06	250	2.82E+03	3760	0.	105.3	24	1.14E+07	240	5.40E+03	3760	0.
26	7.64E+06	271	7.89E+03	4065	0.		26	7.58E+06	271	3.15E+03	4065	0.
28	4.59E+06	291	7.23E+03	4370	0.		28	8.27E+06	291	5.43E+03	4370	0.
30	7.18E+06	311	1.27E+04	4676	0.		30	6.64E+06	311	2.72E+04	4676	0.
LWC	1.26E-03	27	8.96E-04	126	2.09E-02	2.11E-02	LWC	1.51E-03	22	1.14E-03	132	2.84E-02
MED D	27				345	344	MED D	22				355
TOTALS												
2.86E-02 354												

AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING												
INTERVAL START 18124100												
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: GULL-ROSE												
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	P (MB)	SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	P (MB)	
2	5.57E+06	76	0.	400	5.05E+03	466.6	2	2.57E+06	76	4.09E+04	400	5.56E+03
4	9.69E+06	47	9.62E+04	706	2.10E+03	ALT (KM)	4	1.69E+07	47	6.42E+04	706	2.42E+03
6	1.31E+07	67	1.01E+04	1011	4.61E+02	6.078	6	1.63E+07	67	3.02E+04	1011	3.96E+02
8	2.29E+07	37	1.50E+04	1316	9.51E+01		8	2.55E+07	37	1.51E+04	1316	6.20E+01
10	3.27E+07	108	1.42E+04	1622	1.95E+01	TEMP (C)	10	3.56E+07	108	1.84E+04	1622	1.02E+01
12	3.93E+07	128	1.06E+04	1927	5.00E+00	-21.0	12	4.07E+07	128	1.57E+04	1927	6.15E+00
14	3.22E+07	148	1.70E+04	2233	0.		14	3.55E+07	148	7.16E+03	2233	3.77E+00
16	3.20E+07	169	3.90E+03	2538	0.	FROSTPOINT	16	3.21E+07	169	5.00E+03	2538	0.
18	2.84E+07	189	9.49E+03	2843	9.33E-01		18	2.52E+07	189	9.56E+03	2843	0.
20	1.36E+07	209	2.50E+03	3149	0.	TAS (M/S)	20	1.79E+07	209	2.39E+03	3149	0.
22	1.54E+07	230	0.	3454	0.	106.1	22	1.23E+07	230	1.02E+04	3454	0.
24	1.20E+07	250	1.40E+03	3760	0.		24	1.60E+07	250	7.45E+03	3760	0.
26	6.55E+06	271	9.50E+03	4065	0.		26	9.45E+06	271	1.27E+04	4065	0.
28	5.41E+06	291	1.26E+04	4370	0.		28	6.31E+06	291	1.46E+04	4370	0.
30	4.84E+06	311	2.53E+04	4676	0.		30	7.46E+06	311	1.27E+04	4676	0.
LWC	1.33E-03	27	1.43E-03	131	2.57E-02	2.60E-02	LWC	1.44E-03	22	1.41E-03	121	2.43E-02
MED D	27				352	350	MED D	22				356
TOTALS												
2.47E-02 354												

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START 181250Z						INTERVAL START 181250Z							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE						TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	6.19E+06	26	0.	400	6.68E+03	486.7	2	6.71E+06	26	0.	400	7.97E+03	433.2
4	1.25E+07	47	9.40E+04	706	2.12E+03	ALT (MM)	4	1.40E+07	47	1.16E+05	706	1.75E+03	ALT (MM)
6	1.53E+07	67	2.94E+04	1011	2.97E+02	6.361	6	2.35E+07	67	1.48E+04	1011	1.12E+02	6.549
8	2.01E+07	97	1.17E+04	1316	4.74E+01		8	3.72E+07	97	2.39E+04	1316	7.39E+03	
10	4.14E+07	108	2.18E+04	1622	2.83E+00	TEMP (C)	10	6.28E+07	109	2.80E+04	1622	7.39E+03	
12	4.17E+07	128	1.76E+04	1927	2.25E+00	-22.8	12	5.59E+07	129	1.92E+04	1927	0.	-28.4
14	3.52E+07	148	9.24E+03	2233	7.34E-01		14	4.56E+07	149	1.51E+04	2233	0.	
16	3.28E+07	169	7.63E+03	2538	0.	FRGSTOPPOINT	16	3.89E+07	169	1.29E+04	2538	0.	FRGSTOPPOINT
18	2.56E+07	189	6.18E+03	2843	0.		18	3.44E+07	189	5.18E+03	2843	0.	
20	1.75E+07	209	2.25E+03	3149	0.		20	2.71E+07	209	1.18E+04	3149	0.	
22	2.11E+07	230	3.71E+03	3454	0.	TAS (M/S)	22	1.51E+07	230	7.46E+02	3454	0.	TAS (M/S)
24	1.31E+07	250	1.38E+04	3760	0.	106.6	24	1.45E+07	250	1.68E+04	3760	0.	106.6
26	9.44E+06	271	1.24E+04	4065	0.		26	1.40E+07	271	2.79E+04	4065	0.	
28	1.08E+07	291	2.29E+04	4370	0.		28	1.26E+07	291	2.48E+04	4370	0.	
30	6.96E+06	311	2.26E+04	4676	0.		30	8.55E+06	311	3.73E+04	4676	0.	
LWC	1.71E-03		1.89E-03	126		TOTALS	LWC	2.05E-03		2.81E-03	125		TOTALS
MED D	27		311		2.19F-02	309	MED D	27		262	257		
INTERVAL START 181250Z													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.86E+06	26	3.97E+04	400	8.09E+03	482.3	2	4.73E+06	26	0.	400	6.70E+03	433.6
4	1.22E+07	47	8.39E+04	706	1.89E+03	ALT (MM)	4	1.22E+07	47	1.25E+05	706	7.72E+02	ALT (MM)
6	2.15E+07	67	3.93E+04	1011	2.18E+02	6.465	6	1.75E+07	67	4.92E+04	1011	4.31E+01	6.609
8	3.89E+07	97	1.17E+04	1316	1.69E+01		8	3.20E+07	97	2.99E+04	1316	1.33E+00	
10	5.70E+07	108	1.80E+04	1622	1.42E+00	TEMP (C)	10	5.56E+07	109	7.95E+03	1622	0.	TEMP (C)
12	6.51E+07	128	2.78E+04	1927	7.34E-01	-23.1	12	5.24E+07	129	1.18E+04	1927	0.	-23.3
14	4.56E+07	148	1.98E+04	2233	0.		14	4.23E+07	149	1.62E+04	2233	0.	
16	4.88E+07	169	9.78E+03	2538	0.	FRGSTOPPOINT	16	4.20E+07	169	7.61E+03	2538	0.	FRGSTOPPOINT
18	3.83E+07	189	1.04E+04	2843	0.		18	2.89E+07	189	6.18E+03	2843	0.	
20	1.93E+07	209	7.91E+03	3149	0.		20	2.36E+07	209	8.99E+03	3149	0.	
22	1.59E+07	230	7.47E+03	3454	0.	TAS (M/S)	22	1.56E+07	230	6.19E+03	3454	0.	TAS (M/S)
24	1.38E+07	250	8.28E+03	3760	0.	106.1	24	1.20E+07	250	1.37E+04	3760	0.	106.6
26	1.29E+07	271	2.64E+04	4065	0.		26	1.34E+07	271	2.16E+04	4065	0.	
28	1.58E+07	291	4.78E+04	4370	0.		28	1.20E+07	291	3.59E+04	4370	0.	
30	8.11E+06	311	3.72E+04	4676	0.		30	7.51E+06	311	3.50E+04	4676	0.	
LWC	2.16E-03		2.97E-03	126		TOTALS	LWC	1.88E-03		2.74E-03	127		TOTALS
MED D	27		311		1.96E-02	201	MED D	27		285	288		

APWL CIRRHUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING												
INTERVAL START 181200Z												
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: ROLL-ROSE												
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	5.17E+06	26	0.	400	5.08E+03	432.2	2	1.35E+06	75	0.	400	2.09E+02
4	1.11E+07	47	8.19E+04	706	4.12E+02	ALT (KM)	4	7.83E+06	67	4.01E+04	706	3.47E+00
6	1.75E+07	67	1.45E+04	1011	1.81E+01	6.631	6	8.80E+06	67	1.89E+04	1011	0.
8	3.18E+07	87	3.14E+04	1316	1.98E+01		8	1.71E+07	37	1.35E+04	1316	0.
10	5.28E+07	108	5.91E+03	1622	0.	TEMP (C)	10	2.49E+07	108	7.67E+03	1622	0.
12	5.38E+07	128	1.44E+04	1927	0.	-22.8	12	2.19E+07	128	1.82E+04	1927	0.
14	4.69E+07	148	9.01E+03	2233	0.		14	1.65E+07	148	4.19E+04	2233	0.
16	3.21E+07	168	9.21E+03	2538	0.	FROSTPOINT	16	1.41E+07	168	3.39E+04	2538	0.
18	2.96E+07	188	6.93E+03	2843	0.		18	1.43E+07	188	4.65E+04	2843	0.
20	1.68E+07	208	1.53E+04	3149	0.		20	7.17E+06	208	5.79E+04	3149	0.
22	1.40E+07	228	2.53E+04	3454	0.	TAS (M/S)	22	5.56E+06	228	6.59E+04	3454	0.
24	1.59E+07	248	3.47E+04	3760	0.	111.3	24	5.86E+06	248	3.15E+04	3760	0.
26	1.31E+07	268	6.17E+04	4065	0.		26	5.58E+06	268	2.07E+04	4065	0.
28	1.11E+07	288	5.14E+04	4370	0.		28	5.58E+06	288	1.33E+04	4370	0.
30	7.35E+06	311	7.64E+04	4676	0.		30	6.10E+06	311	1.97E+04	4676	0.
TOTALS							TOTALS					
LWC	1.86E-03		5.48E-03		6.65E-03	7.55E-03	LWC	8.70E-04		3.60E-03		1.97E-04
MEQ D	22		126		209	199	MEQ D	24		103		141
APWL CIRRHUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING												
INTERVAL START 181200Z												
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: ROLL-ROSE												
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	2.09E+06	26	0.	400	4.96E+02	429.7	2	5.42E+05	75	0.	400	3.43E+02
4	7.07E+06	47	1.28E+05	706	1.09E+01	ALT (KM)	4	5.64E+06	67	4.03E+04	706	1.16E+01
6	1.42E+07	67	1.79E+04	1011	6.07E-01	6.672	6	1.32E+07	67	9.41E+03	1011	0.
8	2.17E+07	87	5.50E+03	1316	0.		8	2.95E+07	37	1.69E+04	1316	0.
10	3.38E+07	108	7.45E+03	1622	0.	TEMP (C)	10	2.74E+07	108	1.72E+04	1622	0.
12	2.49E+07	128	1.24E+04	1927	0.	-22.8	12	2.60E+07	128	3.41E+04	1927	0.
14	1.83E+07	148	1.52E+04	2233	0.		14	1.31E+07	148	4.92E+04	2233	0.
16	1.62E+07	168	2.24E+04	2538	0.	FROSTPOINT	16	2.69E+07	168	3.58E+04	2538	0.
18	1.65E+07	188	4.26E+04	2843	0.		18	1.56E+07	188	5.18E+04	2843	0.
20	8.11E+06	208	8.02E+04	3149	0.		20	9.67E+06	208	5.21E+04	3149	0.
22	6.82E+06	228	7.09E+04	3454	0.	TAS (M/S)	22	3.76E+06	228	4.18E+04	3454	0.
24	7.55E+06	248	4.90E+04	3760	0.	119.7	24	4.60E+06	248	4.39E+04	3760	0.
26	3.65E+06	268	4.82E+04	4065	0.		26	5.19E+06	268	3.29E+04	4065	0.
28	4.97E+06	288	2.84E+04	4370	0.		28	5.64E+06	288	2.55E+04	4370	0.
30	3.51E+06	311	1.35E+04	4676	0.		30	5.12E+06	311	2.38E+04	4676	0.
TOTALS							TOTALS					
LWC	6.68E-04		4.56E-03		4.89E-04	2.50E-03	LWC	8.59E-04		4.20E-03		3.51E-04
MEQ D	22		108		124	98	MEQ D	22		109		107

AFML CIRRUS STUDY BY AFGL									
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL				
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 18031000					INTERVAL START 18031000				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.58E+06	26	0.	9.08E+02	614.3	2	1.86E+06	26	0.
4	1.01E+07	67	1.29E+05	5.39E+01	ALT (KM)	4	6.09E+06	47	5.99E+04
6	1.67E+07	67	1.86E+04	3.01E+00	6.933	6	1.04E+07	57	9.35E+03
8	2.19E+07	37	1.35E+04	0.	TEMP (C)	8	2.47E+07	0.	1.99E+04
10	3.44E+07	108	9.45E+03	1622 0.	-24.7	10	2.49E+07	109	5.67E+03
12	3.54E+07	128	3.36E+04	1927 0.	FROSTPOINT	12	2.28E+07	129	2.01E+03
14	2.40E+07	149	4.74E+04	2233 0.	-25.9	14	1.54E+07	143	1.11E+03
16	2.83E+07	169	5.09E+04	2578 0.	FROSTPOINT	16	1.69E+07	169	4.55E+03
18	2.49E+07	189	6.37E+04	2843 0.	TAS (M/S)	18	1.49E+07	189	1.08E+04
20	1.81E+07	209	5.67E+04	3149 0.	114.1	20	9.29E+06	209	2.99E+04
22	1.24E+07	210	6.46E+04	3454 0.	TOTALS	22	3.99E+06	230	3.07E+04
24	1.01E+07	250	3.68E+04	3760 0.	3.33E-03	24	6.39E+06	250	3.94E+04
26	9.51E+06	271	3.67E+04	4065 0.	1.08E-03	26	3.59E+06	271	4.72E+04
28	7.53E+06	291	3.36E+04	4370 0.	200	28	6.11E+06	291	4.99E+04
30	9.25E+06	311	4.11E+04	4676 0.	112	30	3.72E+06	311	3.55E+04
LWC	1.50E-03	23	5.28E-03	1.08E-03	98	LWC	8.34E-04	122	3.91E-03
MED D	23	112	112	200	98	MED D	22	122	191
TOTALS	3.33E-03	98	112	200	98	TOTALS	1.30E-03	191	1.99E-03
									147
AFML CIRRUS STUDY BY AFGL									
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL				
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 18031000					INTERVAL START 18031000				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	2.67E+06	26	0.	1.02E+03	600.9	2	1.32E+06	26	0.
4	9.09E+06	47	7.04E+04	4.69E+01	ALT (KM)	4	5.05E+06	47	0.
6	1.20E+07	67	1.88E+04	1.81E+00	7.026	6	1.67E+07	67	4.68E+03
8	2.58E+07	37	0.41E+03	0.	TEMP (C)	8	2.08E+07	0.	5.99E+03
10	3.59E+07	108	1.34E+04	1622 0.	-25.3	10	3.13E+07	109	9.43E+03
12	3.45E+07	128	1.70E+04	1927 0.	FROSTPOINT	12	2.64E+07	129	4.41E+03
14	2.27E+07	149	2.57E+04	2233 0.	-25.9	14	1.41E+07	149	2.21E+03
16	2.69E+07	169	4.04E+04	2578 0.	TAS (M/S)	16	1.01E+07	169	6.42E+03
18	2.57E+07	189	6.45E+04	2843 0.	112.9	18	1.12E+07	189	1.18E+04
20	1.10E+07	209	7.89E+04	3149 0.	TOTALS	20	6.63E+06	209	1.67E+04
22	1.10E+07	230	9.40E+04	3454 0.	1.13E-03	22	5.07E+06	230	2.61E+04
24	9.59E+06	250	6.07E+04	3760 0.	5.78E-03	24	2.99E+06	250	5.00E+04
26	7.30E+06	271	5.65E+04	4065 0.	108	26	5.89E+06	271	3.40E+04
28	7.23E+06	291	4.75E+04	4370 0.	194	28	3.69E+06	291	3.01E+04
30	6.69E+06	311	1.19E+04	4676 0.	98	30	3.18E+06	311	2.95E+04
LWC	1.33E-03	22	5.78E-03	1.13E-03	98	LWC	7.19E-04	120	3.42E-03
MED D	22	108	108	194	98	MED D	27	120	160
TOTALS	3.67E-03	98	108	194	98	TOTALS	1.77E-03	160	1.77E-03
									147



AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 110332100					INTERVAL START 110332100				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.68E+06	26	0.	1.56E+03	394.5	2	3.44E+06	26	0.
4	8.08E+06	47	7.04E+04	5.98E+01	ALT (KM)	4	9.24E+06	47	9.92E+04
6	1.32E+07	67	9.46E+03	6.08E-01	7.281	6	1.77E+07	67	1.85E+04
8	3.49E+07	97	1.69E+04	0.		8	8.33E+07	97	0.71E+03
10	3.79E+07	104	1.53E+04	0.	TEMP (C)	10	4.54E+07	104	7.55E+03
12	3.09E+07	126	5.88E+03	0.	-27.2	12	4.94E+07	126	5.58E+03
14	1.77E+07	144	6.70E+03	0.		14	3.01E+07	144	5.49E+03
16	2.83E+07	169	4.56E+03	0.	PRECIPPOINT	16	3.26E+07	169	9.96E+03
18	1.77E+07	199	2.28E+04	0.		18	2.77E+07	199	3.42E+04
20	1.07E+07	209	5.52E+04	0.		20	1.81E+07	209	6.48E+04
22	9.14E+06	240	5.56E+04	0.	TAS (M/S)	22	1.35E+07	240	7.63E+04
24	6.72E+06	250	6.10E+04	0.	112.0	24	1.35E+07	250	1.08E+05
26	7.02E+06	271	6.13E+04	0.		26	1.37E+07	271	1.08E+05
28	5.91E+06	291	6.59E+04	0.		28	1.03E+07	291	9.09E+04
30	6.18E+06	311	5.59E+04	0.		30	7.29E+06	311	7.24E+04
LWC	1.12E-03	22	6.33E-03	1.64E-03	TOTALS	LWC	1.75E-03	23	9.70E-03
MEQ D	22	121	189	119		MEQ D	23	120	105
TOTALS						TOTALS			
3.47E-03						3.47E-03			
105						105			

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 110332100					INTERVAL START 110332100				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	2.36E+06	26	0.	1.75E+03	397.0	2	8.00E+05	26	3.42E+04
4	8.18E+06	47	8.07E+04	6.38E+01	ALT (KM)	4	9.85E+06	47	6.08E+04
6	1.39E+07	67	9.24E+03	1.20E+00	7.307	6	1.57E+07	67	1.87E+04
8	4.10E+07	97	5.92E+03	0.		8	4.21E+07	97	1.12E+04
10	4.28E+07	134	3.73E+03	0.	TEMP (C)	10	5.00E+07	134	1.90E+03
12	4.72E+07	124	4.16E+03	0.	-27.5	12	4.34E+07	129	2.04E+03
14	3.15E+07	149	6.56E+03	0.		14	3.03E+07	149	9.95E+03
16	3.98E+07	143	9.92E+03	0.	PRECIPPOINT	16	2.05E+07	149	3.20E+04
18	2.38E+07	199	2.53E+04	0.		18	2.61E+07	199	7.29E+04
20	1.31E+07	209	6.56E+04	0.	TAS (M/S)	20	1.44E+07	209	1.08E+05
22	1.26E+07	240	7.52E+04	0.	115.0	22	1.31E+07	240	8.64E+04
24	8.13E+06	250	9.72E+04	0.		24	1.07E+07	250	1.02E+05
26	9.72E+06	271	9.68E+04	0.		26	8.25E+06	271	9.90E+04
28	7.88E+06	291	6.67E+04	0.		28	6.26E+06	291	5.74E+04
30	7.88E+06	311	6.80E+04	0.		30	3.99E+06	311	3.55E+04
LWC	1.48E-03	22	8.03E-03	1.83E-03	TOTALS	LWC	1.40E-03	21	8.37E-03
MEQ D	22	119	189	117		MEQ D	21	113	100
TOTALS						TOTALS			
3.45E-03						3.45E-03			
97						97			



AFML CIRRHUS STUDY BY AFGL													
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 1035410													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.12E+06	26	0.	400	7.84E+02	383.0	2	3.41E+06	26	0.	400	8.42E+02	370.3
4	1.09E+07	47	1.09E+05	706	2.88E+01	7.487	4	1.10E+07	47	7.82E+04	706	7.33E+00	ALT (KM)
6	2.07E+07	57	3.27E+04	1011	0.	7.487	6	3.42E+07	57	1.38E+04	1011	5.90E-01	7.574
8	4.50E+07	37	1.11E+04	1316	0.	7.487	8	5.46E+07	37	5.46E+03	1316	0.	TEMP (C)
10	5.09E+07	124	9.46E+03	1622	0.	7.487	10	4.63E+07	124	7.43E+03	1622	0.	29.7
12	4.21E+07	124	7.01E+03	1927	0.	7.487	12	3.63E+07	124	4.15E+03	1927	0.	FROSTPOINT
14	2.61E+07	144	1.10E+04	2233	0.	7.487	14	2.69E+07	144	1.42E+04	2233	0.	TAS (M/S)
16	3.15E+07	169	2.73E+04	2538	0.	7.487	16	2.41E+07	169	2.60E+04	2538	0.	115.6
18	2.00E+07	189	7.95E+04	2843	0.	7.487	18	2.32E+07	189	6.11E+04	2843	0.	TOTALS
20	1.19E+07	219	1.24E+05	3149	0.	7.487	20	1.07E+07	219	6.77E+04	3149	0.	LWC
22	1.27E+07	270	1.15E+05	3454	0.	7.487	22	1.07E+07	270	9.07E+04	3454	0.	MEQ 0
24	9.54E+06	250	1.10E+05	3760	0.	7.487	24	8.95E+06	250	7.22E+04	3760	0.	7.71E-04
26	9.80E+06	271	9.86E+04	4065	0.	7.487	26	8.37E+06	271	7.26E+04	4065	0.	149
28	7.55E+06	291	5.72E+04	4370	0.	7.487	28	6.55E+06	291	6.46E+04	4370	0.	TOTALS
30	6.16E+06	311	3.53E+04	4676	0.	7.487	30	6.29E+06	311	3.67E+04	4676	0.	LWC
LWC	1.41E-03	22	8.65E-03	112	8.15E-04	189	LWC	1.28E-03	22	7.11E-03	145	7.71E-04	MEQ 0
MEQ 0	22	112	189	381.2	3.94E-03	97	MEQ 0	22	145	3.14E-03	98	149	98

AFML CIRRHUS STUDY BY AFGL													
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 1035410													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.88E+06	26	3.75E+04	400	5.91E+02	381.2	2	2.31E+06	26	0.	400	1.13E+03	377.2
4	6.54E+06	47	4.93E+04	706	1.29E+01	7.522	4	1.15E+07	47	1.86E+05	706	3.57E+01	ALT (KM)
6	2.65E+07	57	9.27E+03	1011	5.94E-01	7.522	6	4.20E+07	57	1.81E+04	1011	0.	7.595
8	4.69E+07	37	8.21E+03	1316	0.	7.522	8	4.03E+07	37	5.75E+03	1316	0.	TEMP (C)
10	4.25E+07	124	7.45E+03	1622	0.	7.522	10	3.64E+07	124	1.10E+04	1622	0.	29.9
12	3.90E+07	124	6.17E+03	1927	0.	7.522	12	3.21E+07	124	4.04E+03	1927	0.	FROSTPOINT
14	2.12E+07	143	1.04E+04	2233	0.	7.522	14	2.36E+07	143	2.14E+03	2233	0.	TAS (M/S)
16	2.12E+07	199	1.44E+04	2538	0.	7.522	16	2.41E+07	199	7.04E+03	2538	0.	147.7
18	1.73E+07	199	6.12E+04	2843	0.	7.522	18	2.05E+07	199	3.05E+04	2843	0.	TOTALS
20	1.34E+07	209	6.15E+04	3149	0.	7.522	20	1.80E+07	209	4.97E+04	3149	0.	LWC
22	8.14E+06	270	8.16E+04	3454	0.	7.522	22	7.43E+06	270	5.58E+04	3454	0.	MEQ 0
24	6.28E+06	290	9.62E+04	3760	0.	7.522	24	7.71E+06	290	6.00E+04	3760	0.	7.71E-03
26	6.55E+06	271	5.98E+04	4065	0.	7.522	26	5.55E+06	271	5.99E+04	4065	0.	147.7
28	6.07E+06	291	5.18E+04	4370	0.	7.522	28	6.47E+06	291	4.88E+04	4370	0.	TOTALS
30	5.77E+06	311	3.88E+04	4676	0.	7.522	30	3.33E+06	311	1.90E+04	4676	0.	LWC
LWC	1.11E-03	22	6.21E-03	119	5.79E-04	184	LWC	1.05E-03	22	4.71E-03	119	1.14E-03	MEQ 0
MEQ 0	22	119	184	381.2	2.73E-03	97	MEQ 0	22	119	1.14E-03	147	2.50E-03	147

AFML CIRRUS STUDY BY AFGL												
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E7B-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 10137100						INTERVAL START 10137100						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MR)	
2	3.52E+06	26	0.	1.71E+03	376.8	2	3.01E+06	26	0.	3.46E+03	377.5	
4	2.34E+07	47	2.83E+04	9.86E+01	ALT (MM)	4	3.19E+07	47	6.56E+04	706	1.99E+02	ALT (MM)
6	5.10E+07	67	8.85E+03	1.72E+00	7.502	6	6.25E+07	67	8.82E+03	1011	5.70E+00	7.590
8	5.69E+07	87	0.	0.		8	7.24E+07	87	7.87E+03	1316	0.	
10	4.50E+07	108	8.98E+03	1622	TEMP (C)	10	6.01E+07	108	3.57E+03	1622	0.	TEMP (C)
12	3.29E+07	129	3.98E+03	1927	-30.0	12	6.18E+07	129	5.59E+03	1927	0.	-30.0
14	2.44E+07	149	7.32E+03	2233	0.	14	3.44E+07	149	1.04E+03	2233	0.	0.
16	2.21E+07	169	6.09E+03	2538	0.	16	2.54E+07	169	8.56E+02	2538	0.	0.
18	1.86E+07	189	1.21E+04	2843	0.	18	1.98E+07	189	2.77E+03	2843	0.	0.
20	9.10E+06	209	3.68E+04	3149	0.	20	1.84E+07	209	1.01E+04	3149	0.	0.
22	6.05E+06	229	4.13E+04	3454	0.	22	9.52E+06	229	1.00E+04	3454	0.	0.
24	6.04E+06	249	3.97E+04	3760	0.	24	1.05E+07	249	2.85E+04	3760	0.	0.
26	7.29E+06	269	5.45E+04	4065	0.	26	1.05E+07	269	3.61E+04	4065	0.	0.
28	8.53E+06	289	5.27E+04	4370	0.	28	0.77E+06	289	3.81E+04	4370	0.	0.
30	4.52E+06	311	5.21E+04	4676	0.	30	5.52E+06	311	3.90E+04	4676	0.	0.
LWC	1.10E-03	21	5.06E-03	1.74E-03	197	TOTALS	LWC	1.48E-03	3.24E-03	4.02E-03	190	TOTALS
MED 0			123	167	144		MED 0		126	190	191	

AFML CIRRUS STUDY BY AFGL												
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E7B-03 ON 26 FEB 78 30 SECOND AVERAGING						
INTERVAL START 10137100						INTERVAL START 10137100						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MR)	SIZE (MU)	SCATTER FROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MR)	
2	5.50E+06	26	0.	2.63E+03	377.2	2	8.40E+06	26	0.	2.70E+03	376.1	
4	2.81E+07	47	7.53E+04	1.89E+02	ALT (MM)	4	3.64E+07	47	6.80E+04	706	1.48E+02	ALT (MM)
6	5.59E+07	67	1.33E+04	2.29E+00	7.595	6	6.12E+07	67	4.49E+03	1011	5.49E+00	7.614
8	6.79E+07	87	1.57E+04	0.		8	5.88E+07	87	0.	1316	0.	
10	4.74E+07	108	1.79E+03	1622	TEMP (C)	10	4.56E+07	108	9.09E+03	1622	0.	TEMP (C)
12	3.28E+07	129	3.99E+03	1927	-29.9	12	3.65E+07	129	5.59E+03	1927	0.	-30.0
14	2.51E+07	149	4.17E+03	2233	0.	14	2.32E+07	149	7.42E+03	2233	0.	0.
16	2.71E+07	169	0.	2538	0.	16	2.65E+07	169	2.62E+03	2538	0.	0.
18	2.81E+07	189	3.71E+03	2843	0.	18	2.27E+07	189	9.43E+02	2843	0.	0.
20	1.00E+07	209	1.21E+04	3149	0.	20	1.49E+07	209	6.47E+03	3149	0.	0.
22	9.27E+06	229	2.00E+04	3454	0.	22	9.94E+06	229	7.92E+03	3454	0.	0.
24	7.52E+06	249	3.22E+04	3760	0.	24	7.40E+06	249	2.81E+04	3760	0.	0.
26	5.76E+06	269	3.06E+04	4065	0.	26	6.37E+06	269	2.41E+04	4065	0.	0.
28	4.78E+06	289	4.62E+04	4370	0.	28	5.18E+06	289	3.83E+04	4370	0.	0.
30	7.26E+06	311	3.90E+04	4676	0.	30	4.59E+06	311	4.72E+04	4676	0.	0.
LWC	1.25E-03	21	3.52E-03	2.80E-03	191	TOTALS	LWC	1.15E-03	2.96E-03	3.09E-03	197	TOTALS
MED 0			125	191	190		MED 0		129	197	199	

AFML CIRRUS STUDY BY AFGL										AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76					30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76					30 SECOND AVERAGING							
INTERVAL START -103810					INTERVAL START -103910					INTERVAL START -103910					INTERVAL START -103910							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE					TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)					
2	1.78E+07	26	0.	3.77E+03	376.3	2	9.14E+07	26	0.	1.11E+03	375.1	2	9.14E+07	26	0.	1.11E+03	375.1					
4	8.42E+07	706	5.74E+04	2.07E+02	ALT (KM)	4	1.06E+08	67	7.71E+04	706	1.45E+01	ALT (KM)	4	1.06E+08	67	7.71E+04	706					
6	1.06E+08	57	8.98E+03	5.82E+00	7.611	6	8.76E+07	67	1.81E+04	1011	5.85E-01	ALT (KM)	6	8.76E+07	67	1.81E+04	1011					
8	9.17E+07	37	1.60E+04	1316	0.	8	6.38E+07	97	2.68E+03	1316	0.	TEMP (C)	8	6.38E+07	97	2.68E+03	1316					
10	6.04E+07	104	1.45E+04	1622	0.	10	5.88E+07	104	9.16E+03	1622	0.	TEMP (C)	10	5.88E+07	104	9.16E+03	1622					
12	5.05E+07	123	3.08E+03	1927	0.	12	4.31E+07	123	6.78E+03	1927	0.	TEMP (C)	12	4.31E+07	123	6.78E+03	1927					
14	3.75E+07	143	3.18E+03	2233	0.	14	3.03E+07	143	6.41E+03	2233	0.	TEMP (C)	14	3.03E+07	143	6.41E+03	2233					
16	3.66E+07	169	4.37E+03	2538	0.	16	2.86E+07	169	6.17E+03	2538	0.	TEMP (C)	16	2.86E+07	169	6.17E+03	2538					
18	3.76E+07	199	3.78E+03	2843	0.	18	2.99E+07	199	2.19E+04	2843	0.	TEMP (C)	18	2.99E+07	199	2.19E+04	2843					
20	1.85E+07	219	4.12E+03	3149	0.	20	1.47E+07	219	3.77E+04	3149	0.	TEMP (C)	20	1.47E+07	219	3.77E+04	3149					
22	1.77E+07	230	2.04E+04	3454	0.	22	9.50E+06	230	7.65E+04	3454	0.	TEMP (C)	22	9.50E+06	230	7.65E+04	3454					
24	1.20E+07	250	1.51E+04	3760	0.	24	1.00E+07	250	9.08E+04	3760	0.	TEMP (C)	24	1.00E+07	250	9.08E+04	3760					
26	1.30E+07	271	3.12E+04	4065	0.	26	8.22E+06	271	1.14E+05	4065	0.	TEMP (C)	26	8.22E+06	271	1.14E+05	4065					
28	1.55E+07	291	4.53E+04	4370	0.	28	7.56E+06	291	7.18E+04	4370	0.	TEMP (C)	28	7.56E+06	291	7.18E+04	4370					
30	7.13E+06	311	6.42E+04	4676	0.	30	6.68E+06	311	5.51E+04	4676	0.	TEMP (C)	30	6.68E+06	311	5.51E+04	4676					
TOTALS						TOTALS						TOTALS						TOTALS				
LWC	1.86E-03		3.94E-03	4.37E-03		LWC	1.47E-03		7.91E-03	1.04E-03		LWC	1.47E-03		7.91E-03	1.04E-03						
MEQ	0	22	130	197		MEQ	0	21	119	190		MEQ	0	22	122	199						

AFML CIRRUS STUDY BY AFGL										AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76					30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76					30 SECOND AVERAGING							
INTERVAL START -103810					INTERVAL START -103910					INTERVAL START -103910					INTERVAL START -103910							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE					TYPE: BULL-ROSE					TYPE: BULL-ROSE					TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)					
2	6.63E+07	75	0.	2.21E+03	376.4	2	1.07E+08	76	0.	1.10E+03	376.8	2	1.07E+08	76	0.	1.10E+03	376.8					
4	1.13E+08	47	7.70E+04	5.76E+01	ALT (KM)	4	1.01E+08	47	1.26E+05	706	1.23E+01	ALT (KM)	4	1.01E+08	47	1.26E+05	706					
6	9.53E+07	57	1.75E+04	1.17E+00	7.610	6	7.82E+07	67	2.71E+02	1011	0.	TEMP (C)	6	7.82E+07	67	2.71E+02	1011					
8	7.20E+07	97	2.69E+03	1316	0.	8	6.41E+07	97	2.71E+02	1316	0.	TEMP (C)	8	6.41E+07	97	2.71E+02	1316					
10	5.35E+07	118	9.15E+03	1622	0.	10	5.76E+07	104	0.	1622	0.	TEMP (C)	10	5.76E+07	104	0.	1622					
12	6.06E+07	128	6.13E+03	1927	0.	12	4.32E+07	128	1.37E+03	1927	0.	TEMP (C)	12	4.32E+07	128	1.37E+03	1927					
14	3.36E+07	144	4.26E+03	2233	0.	14	3.02E+07	144	4.30E+03	2233	0.	TEMP (C)	14	3.02E+07	144	4.30E+03	2233					
16	3.07E+07	169	4.59E+03	2538	0.	16	3.29E+07	169	3.54E+03	2538	0.	TEMP (C)	16	3.29E+07	169	3.54E+03	2538					
18	2.49E+07	199	1.52E+04	2843	0.	18	2.82E+07	199	2.01E+04	2843	0.	TEMP (C)	18	2.82E+07	199	2.01E+04	2843					
20	1.61E+07	203	2.90E+04	3149	0.	20	1.08E+07	209	4.28E+04	3149	0.	TEMP (C)	20	1.08E+07	209	4.28E+04	3149					
22	1.41E+07	210	3.54E+04	3454	0.	22	8.78E+06	230	6.77E+04	3454	0.	TEMP (C)	22	8.78E+06	230	6.77E+04	3454					
24	1.38E+07	220	5.97E+04	3760	0.	24	1.66E+07	230	7.65E+04	3760	0.	TEMP (C)	24	1.66E+07	230	7.65E+04	3760					
26	8.46E+06	271	7.84E+04	4065	0.	26	1.08E+07	271	9.18E+04	4065	0.	TEMP (C)	26	1.08E+07	271	9.18E+04	4065					
28	8.20E+06	291	6.02E+04	4370	0.	28	8.77E+06	291	9.84E+04	4370	0.	TEMP (C)	28	8.77E+06	291	9.84E+04	4370					
30	8.20E+06	311	7.21E+04	4676	0.	30	5.68E+06	311	6.31E+04	4676	0.	TEMP (C)	30	5.68E+06	311	6.31E+04	4676					
TOTALS						TOTALS						TOTALS						TOTALS				
LWC	1.65E-03		6.33E-03	2.19E-03		LWC	1.47E-03		7.94E-03	1.01E-03		LWC	1.47E-03		7.94E-03	1.01E-03						
MEQ	0	22	124	189		MEQ	0	22	122	199		MEQ	0	22	122	199						

AFML CIRRHUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 11041100									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	P (MM)
2	3.01E+07	76	0.	400	3.17E+03	2	5.32E+08	26	0.
4	1.80E+08	47	1.46E+05	706	1.11E+02	4	3.20E+07	47	1.00E+04
6	1.50E+08	67	1.37E+04	1011	4.15E+00	6	2.49E+07	67	0.
8	1.22E+08	47	1.09E+04	1316	0.	8	2.12E+07	57	5.50E+03
10	9.40E+07	108	1.40E+04	1622	0.	10	1.30E+07	128	1.08E+03
12	7.50E+07	128	8.23E+03	1927	0.	12	1.37E+07	128	5.60E+03
14	4.51E+07	148	3.24E+03	2233	0.	14	7.14E+06	148	1.10E+03
16	5.24E+07	168	5.23E+03	2538	0.	16	8.20E+06	168	1.81E+03
18	3.37E+07	188	1.06E+04	2843	0.	18	8.47E+06	188	2.94E+03
20	3.01E+07	208	3.15E+04	3149	0.	20	5.12E+06	208	3.20E+03
22	2.13E+07	228	7.26E+04	3454	0.	22	2.46E+06	228	3.54E+03
24	1.74E+07	248	9.49E+04	3760	0.	24	1.89E+06	248	9.14E+02
26	1.57E+07	268	1.33E+05	4065	0.	26	1.85E+06	268	1.10E+04
28	1.38E+07	288	1.55E+05	4370	0.	28	1.44E+06	288	1.40E+04
30	1.35E+07	308	1.48E+05	4676	0.	30	7.52E+05	308	3.91E+03
TOTALS					TOTALS				
LWC	2.76E-03	22	1.25E-02	3.32E-03	189	LWC	3.67E-04	19	0.52E-04
MEQ	0		126	189		MEQ	0	120	227
AFML CIRRHUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 11041100									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	P (MM)
2	8.47E+07	26	7.43E+04	400	3.60E+03	2	3.54E+08	26	0.
4	1.82E+08	47	1.47E+05	706	2.66E+02	4	3.50E+07	47	2.61E+04
6	1.21E+08	67	3.22E+04	1011	1.19E+01	6	2.51E+07	67	0.
8	9.69E+07	87	1.64E+04	1316	6.29E-01	8	2.30E+07	87	2.61E+03
10	7.25E+07	108	1.86E+04	1622	0.	10	2.14E+07	108	1.91E+03
12	5.67E+07	128	9.87E+03	1927	0.	12	1.66E+07	128	4.24E+03
14	3.50E+07	148	7.60E+03	2233	0.	14	9.65E+06	148	1.22E+04
16	4.33E+07	168	3.57E+03	2538	0.	16	1.02E+07	168	1.10E+04
18	3.21E+07	188	1.26E+04	2843	0.	18	1.13E+07	188	2.77E+04
20	1.96E+07	208	1.27E+04	3149	0.	20	4.61E+06	208	4.32E+04
22	1.54E+07	228	2.67E+04	3454	0.	22	6.42E+06	228	3.80E+04
24	1.33E+07	248	3.86E+04	3760	0.	24	5.62E+06	248	5.64E+04
26	1.02E+07	268	4.93E+04	4065	0.	26	5.35E+06	268	2.08E+04
28	1.07E+07	288	6.79E+04	4370	0.	28	3.74E+06	288	1.36E+04
30	9.14E+06	308	8.52E+04	4676	0.	30	3.21E+06	308	1.19E+04
TOTALS					TOTALS				
LWC	1.58E-03	21	5.90E-03	4.56E-03	206	LWC	6.89E-04	23	2.45E-03
MEQ	0		128	206		MEQ	0	196	209
AFML CIRRHUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 11041100									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MM)	SCATTER PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	PRECIP PROBE	SIZE (MM)	CLOUD PROBE	SIZE (MM)	P (MM)
2	8.47E+07	26	7.43E+04	400	3.60E+03	2	3.54E+08	26	0.
4	1.82E+08	47	1.47E+05	706	2.66E+02	4	3.50E+07	47	2.61E+04
6	1.21E+08	67	3.22E+04	1011	1.19E+01	6	2.51E+07	67	0.
8	9.69E+07	87	1.64E+04	1316	6.29E-01	8	2.30E+07	87	2.61E+03
10	7.25E+07	108	1.86E+04	1622	0.	10	2.14E+07	108	1.91E+03
12	5.67E+07	128	9.87E+03	1927	0.	12	1.66E+07	128	4.24E+03
14	3.50E+07	148	7.60E+03	2233	0.	14	9.65E+06	148	1.22E+04
16	4.33E+07	168	3.57E+03	2538	0.	16	1.02E+07	168	1.10E+04
18	3.21E+07	188	1.26E+04	2843	0.	18	1.13E+07	188	2.77E+04
20	1.96E+07	208	1.27E+04	3149	0.	20	4.61E+06	208	4.32E+04
22	1.54E+07	228	2.67E+04	3454	0.	22	6.42E+06	228	3.80E+04
24	1.33E+07	248	3.86E+04	3760	0.	24	5.62E+06	248	5.64E+04
26	1.02E+07	268	4.93E+04	4065	0.	26	5.35E+06	268	2.08E+04
28	1.07E+07	288	6.79E+04	4370	0.	28	3.74E+06	288	1.36E+04
30	9.14E+06	308	8.52E+04	4676	0.	30	3.21E+06	308	1.19E+04
TOTALS					TOTALS				
LWC	1.58E-03	21	5.90E-03	4.56E-03	206	LWC	6.89E-04	23	2.45E-03
MEQ	0		128	206		MEQ	0	196	209



AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 18142100						INTERVAL START 18142100					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.82E+08	25	0.	4.12E+01	375.9	2	9.66E+08	26	0.	2.34E+02	368.1
4	2.72E+07	47	9.92E+03	706	2.30E+00	4	1.12E+07	47	0.	1.94E+01	ALT (MM)
6	1.56E+07	67	4.65E+03	1011	7.618	6	8.16E+06	67	4.46E+03	1011	7.765
8	1.38E+07	87	5.52E+03	1316	0.	8	4.34E+06	87	0.	1316	0.
10	1.32E+07	108	1.87E+03	1622	0.	10	4.59E+06	108	0.	1622	0.
12	9.79E+06	128	4.17E+03	1927	30.3	12	3.31E+06	128	0.	1927	0.
14	6.36E+06	148	4.40E+03	2233	0.	14	1.02E+06	148	2.12E+03	2233	0.
16	6.08E+06	168	9.08E+03	2538	0.	16	2.56E+06	168	0.	2538	0.
18	4.23E+06	188	2.75E+04	2843	0.	18	1.54E+06	188	0.	2843	0.
20	2.55E+06	208	2.46E+04	3149	0.	20	5.09E+05	208	1.03E+03	3149	0.
22	2.51E+06	228	2.12E+04	3454	0.	22	7.64E+05	228	2.27E+03	3454	0.
24	1.06E+06	248	7.85E+03	3760	114.5	24	2.88E+05	248	2.51E+03	3760	0.
26	1.59E+06	268	1.03E+04	4065	0.	26	2.55E+05	268	0.	4065	0.
28	2.11E+06	288	8.41E+03	4370	0.	28	1.02E+06	288	1.63E+03	4370	0.
30	1.06E+06	308	3.92E+03	4676	0.	30	2.54E+05	308	7.55E+03	4676	0.
LWC	2.84E-04	21	1.29E-03	103	TOTALS	LWC	1.06E-04	3.22E-04	2.95E-04	205	TOTALS
MED 0					7.54E-04	MED 0					3.48E-04
					195						190

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 18142100						INTERVAL START 18142100					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.66E+08	25	0.	3.03E+02	372.4	2	9.52E+08	26	0.	1.03E+02	368.0
4	8.78E+06	47	9.66E+03	706	2.30E+01	4	1.08E+07	47	9.66E+03	706	ALT (MM)
6	7.48E+06	67	0.	1011	7.685	6	7.70E+06	67	0.	1011	7.665
8	6.72E+06	87	0.	1316	0.	8	7.44E+06	87	0.	1316	0.
10	4.51E+06	108	0.	1622	0.	10	5.39E+06	108	0.	1622	0.
12	3.87E+06	128	2.73E+03	1927	30.1	12	3.33E+06	128	1.66E+03	1927	0.
14	3.61E+06	148	1.07E+03	2233	0.	14	3.33E+06	148	1.07E+03	2233	0.
16	3.10E+06	168	6.62E+02	2538	0.	16	2.56E+06	168	0.83E+02	2538	0.
18	2.32E+06	188	0.	2843	0.	18	2.56E+06	188	9.54E+02	2843	0.
20	1.54E+06	208	0.	3149	0.	20	1.28E+06	208	2.07E+03	3149	0.
22	1.29E+06	228	1.16E+03	3454	0.	22	1.02E+06	228	2.26E+03	3454	0.
24	5.15E+05	248	0.	3760	0.	24	1.03E+06	248	2.53E+03	3760	0.
26	5.15E+05	268	0.	4065	0.	26	1.03E+06	268	5.68E+03	4065	0.
28	1.29E+06	288	1.65E+03	4370	0.	28	7.73E+05	288	6.16E+03	4370	0.
30	1.29E+06	308	0.	4676	0.	30	2.56E+05	308	3.76E+03	4676	0.
LWC	1.75E-04	27	6.59E-05	123	TOTALS	LWC	1.44E-04	4.85E-04	7E-05	179	TOTALS
MED 0					3.71E-04	MED 0					1.59E-04
					203						131



AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 11045110*					INTERVAL START 11045110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	9.58E+04	26	0.	356.1	2	1.31E+09	26	0.	356.1
4	8.80E+06	47	0.	7.956	4	1.04E+06	47	0.	7.956
6	4.40E+06	67	0.	7.956	6	1.05E+06	67	0.	7.956
8	5.69E+05	87	2.72E+03	1316	8	2.62E+09	87	0.	1316
10	5.18E+06	108	0.	1622	10	5.24E+05	108	0.	1622
12	3.62E+06	128	0.	1927	12	7.65E+05	128	0.	1927
14	1.56E+06	148	1.08E+03	2233	14	5.22E+05	148	0.	2233
16	2.73E+06	169	0.	2538	16	2.62E+09	169	0.99E+02	2538
18	1.82E+06	189	9.62E+02	2843	18	0.	189	0.	2843
20	2.59E+05	209	0.	3149	20	2.40E+05	209	0.	3149
22	5.18E+05	230	0.	3454	22	0.	230	0.	3454
24	2.40E+05	250	1.24E+03	3760	24	0.	250	1.29E+03	3760
26	1.04E+06	271	4.38E+03	4065	26	0.	271	0.	4065
28	2.59E+05	291	1.65E+03	4370	28	0.	291	0.	4370
30	2.62E+05	311	1.92E+03	4676	30	2.62E+05	311	0.	4676
LWC	9.41E-05	121	1.98E-04	174	LWC	2.56E-05	12	2.29E-05	246
MED D	18	121	121	174	MED D	12	190	190	206
TOTALS					TOTALS				
9.41E-05 121 1.98E-04 174					2.56E-05 12 2.29E-05 246				

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 11045110*					INTERVAL START 11045110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.17E+09	26	0.	356.0	2	1.32E+09	26	0.	356.1
4	2.62E+06	47	9.85E+03	8.016	4	2.60E+05	47	0.	8.034
6	1.05E+06	67	0.	1011	6	0.	67	0.	1011
8	2.39E+06	87	0.	1316	8	0.	87	0.	1316
10	1.05E+06	108	0.	1622	10	0.	108	0.	1622
12	1.57E+06	128	0.	1927	12	2.61E+05	128	0.	1927
14	1.05E+06	148	0.	2233	14	2.60E+05	148	0.	2233
16	5.23E+05	169	0.	2538	16	0.	169	0.	2538
18	2.62E+05	189	9.71E+02	2843	18	0.	189	9.66E+02	2843
20	0.	209	1.08E+03	3149	20	0.	209	0.	3149
22	2.62E+05	230	0.	3454	22	0.	230	0.	3454
24	0.	250	0.	3760	24	2.59E+05	250	0.	3760
26	0.	271	0.	4065	26	0.	271	0.	4065
28	0.	291	0.	4370	28	0.	291	0.	4370
30	2.62E+05	311	0.	4676	30	0.	311	0.	4676
LWC	3.26E-05	87	1.89E-05	169	LWC	1.60E-05	3	6.20E-06	175
MED D	13	87	87	169	MED D	3	34	34	175
TOTALS					TOTALS				
3.26E-05 87 1.89E-05 169					1.60E-05 3 6.20E-06 175				

AFML CIRRUS STUDY BY AFGL										AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-07 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-07 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START *100000*					INTERVAL START *100000*					INTERVAL START *100000*									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE# BULL-ROSE					TYPE# BULL-ROSE					TYPE# BULL-ROSE									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)					
2	1.46E+09	26	0.	353.5	2	1.46E+09	26	0.	353.5	2	1.35E+09	26	0.	350.0					
4	0.	47	0.	ALT (KM)	4	0.	47	0.	ALT (KM)	4	1.02E+06	47	0.	ALT (KM)					
6	0.	57	0.	8.045	6	0.	57	0.	8.045	6	5.11E+05	57	0.	8.097					
8	0.	97	0.		8	0.	97	0.		8	2.55E+05	97	0.						
10	0.	104	0.	TEMP (C)	10	0.	104	0.	TEMP (C)	10	0.	103	0.	TEMP (C)					
12	0.	123	0.	-31.5	12	0.	123	0.	-31.5	12	2.59E+05	123	0.	-31.7					
14	0.	148	0.		14	0.	148	0.		14	0.	143	0.						
16	2.60E+05	159	0.	FRCSTPOINT	16	2.60E+05	159	0.	FRCSTPOINT	16	0.	169	0.	FRCSTPOINT					
18	0.	189	0.		18	0.	189	0.		18	0.	184	0.						
20	0.	209	0.		20	0.	209	0.		20	0.	209	0.						
22	2.59E+05	230	0.	TAS (M/S)	22	2.59E+05	230	0.	TAS (M/S)	22	0.	230	0.	TAS (M/S)					
24	0.	250	0.	116.4	24	0.	250	0.	116.4	24	0.	250	0.	116.1					
26	0.	271	0.		26	0.	271	0.		26	0.	271	0.						
28	0.	291	0.		28	0.	291	0.		28	0.	291	0.						
30	0.	311	0.		30	0.	311	0.		30	2.55E+05	311	0.						
TOTALS					TOTALS					TOTALS									
LWC	1.62E-05	0.	0	0.	LWC	1.62E-05	0.	0	0.	LWC	1.62E-05	0.	0	0.					
MED	0	0	0	0	MED	0	0	0	0	MED	0	0	0	0					

AFML CIRRUS STUDY BY AFGL										AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-07 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-07 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START *100000*					INTERVAL START *100000*					INTERVAL START *100000*									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE# BULL-ROSE					TYPE# BULL-ROSE					TYPE# BULL-ROSE									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)					
2	1.46E+09	26	0.	352.6	2	1.46E+09	26	0.	352.6	2	1.52E+09	26	0.	346.3					
4	2.55E+05	47	0.	ALT (KM)	4	2.55E+05	47	0.	ALT (KM)	4	5.14E+05	47	0.	ALT (KM)					
6	0.	57	0.	8.063	6	0.	57	0.	8.063	6	0.	57	0.	8.147					
8	2.60E+05	97	0.		8	2.60E+05	97	0.		8	0.	97	0.						
10	2.55E+05	103	0.	TEMP (C)	10	2.55E+05	103	0.	TEMP (C)	10	0.	104	0.	TEMP (C)					
12	0.	123	0.	-31.7	12	0.	123	0.	-31.7	12	0.	123	0.	-31.9					
14	0.	148	0.		14	0.	148	0.		14	0.	143	0.						
16	2.59E+05	153	0.	FRCSTPOINT	16	2.59E+05	153	0.	FRCSTPOINT	16	0.	169	0.	FRCSTPOINT					
18	5.15E+05	149	0.		18	5.15E+05	149	0.		18	0.	183	0.						
20	0.	209	0.		20	0.	209	0.		20	0.	209	0.						
22	0.	230	0.	TAS (M/S)	22	0.	230	0.	TAS (M/S)	22	0.	230	0.	TAS (M/S)					
24	0.	250	0.	117.0	24	0.	250	0.	117.0	24	0.	250	0.	117.7					
26	0.	271	0.		26	0.	271	0.		26	0.	271	0.						
28	0.	291	0.		28	0.	291	0.		28	0.	291	0.						
30	0.	311	0.		30	0.	311	0.		30	0.	311	0.						
TOTALS					TOTALS					TOTALS									
LWC	1.71E-05	0.	0	0.	LWC	1.71E-05	0.	0	0.	LWC	1.28E-05	0.	0	0.					
MED	0	0	0	0	MED	0	0	0	0	MED	0	0	0	0					

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING				
INTERVAL START 18049+10					INTERVAL START 18049+10				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: SULL-ROSE					TYPE: SULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.47E+09	26	0.	340.2	2	1.34E+09	26	0.	340.2
4	1.03E+06	47	0.	ALT (KM)	4	3.79E+06	47	0.	ALT (KM)
6	7.74E+05	67	0.	8.189	6	2.78E+06	67	0.	8.233
8	5.15E+05	87	0.	TEMP (C)	8	2.27E+06	87	0.	TEMP (C)
10	5.15E+05	108	0.	-32.1	10	1.77E+06	108	0.	TEMP (C)
12	2.58E+05	128	0.	PRECIPITATION	12	1.77E+06	128	0.	PRECIPITATION
14	2.58E+05	148	0.	2538	14	7.57E+05	148	0.	2538
16	0.	169	0.	2843	16	5.06E+05	169	0.	2843
18	0.	189	0.	3149	18	1.01E+06	189	0.	3149
20	0.	209	0.	TAS (M/S)	20	0.	209	0.	TAS (M/S)
22	0.	229	0.	117.2	22	0.	229	0.	117.2
24	2.58E+05	250	0.	4065	24	5.06E+05	250	0.	4065
26	0.	271	0.	4370	26	0.	271	0.	4370
28	0.	291	0.	4676	28	0.	291	0.	4676
30	0.	311	0.	TOTALS	30	2.52E+05	311	0.	TOTALS
LWC	1.84E-05	0.	2.43E-05	194	LWC	4.33E-05	120	2.25E-04	175
MED D	2	0	194	194	MED D	16	120	175	102

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78					30 SECOND AVERAGING				
INTERVAL START 18049+10					INTERVAL START 18049+10				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: SULL-ROSE					TYPE: SULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.47E+09	26	0.	340.2	2	1.34E+09	26	0.	340.2
4	1.03E+06	47	0.	ALT (KM)	4	3.79E+06	47	0.	ALT (KM)
6	7.74E+05	67	0.	8.189	6	2.78E+06	67	0.	8.233
8	5.15E+05	87	0.	TEMP (C)	8	2.27E+06	87	0.	TEMP (C)
10	5.15E+05	108	0.	-32.1	10	1.77E+06	108	0.	TEMP (C)
12	2.58E+05	128	0.	PRECIPITATION	12	1.77E+06	128	0.	PRECIPITATION
14	2.58E+05	148	0.	2538	14	7.57E+05	148	0.	2538
16	0.	169	0.	2843	16	5.06E+05	169	0.	2843
18	0.	189	0.	3149	18	1.01E+06	189	0.	3149
20	0.	209	0.	TAS (M/S)	20	0.	209	0.	TAS (M/S)
22	0.	229	0.	117.2	22	0.	229	0.	117.2
24	2.58E+05	250	0.	4065	24	5.06E+05	250	0.	4065
26	0.	271	0.	4370	26	0.	271	0.	4370
28	0.	291	0.	4676	28	0.	291	0.	4370
30	0.	311	0.	TOTALS	30	2.52E+05	311	0.	TOTALS
LWC	1.84E-05	0.	2.43E-05	194	LWC	4.33E-05	120	2.25E-04	175
MED D	2	0	194	194	MED D	16	120	175	102

AFML CIRRUS STUDY 9Y AFGL													
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING													
INTERVAL START 18051000													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	8.00E+08	26	0.	400	1.95E+02	383.4	2	1.25E+09	25	0.	400	5.62E+02	344.4
4	3.07E+07	47	1.85E+04	706	1.06E+00	ALT (KM)	4	1.18E+07	47	0.80E+03	706	1.66E+02	ALT (KM)
6	1.84E+07	67	0.	1011	0.	8.244	6	6.53E+06	67	4.13E+03	1011	4.66E+00	6.226
8	1.99E+07	87	2.57E+03	1316	0.		8	0.57E+06	87	0.	1316	1.53E+00	
10	1.14E+07	108	3.49E+03	1622	0.	TEMP (C)	10	3.92E+06	108	1.67E+03	1622	0.	TEMP (C)
12	9.58E+06	128	0.	1927	0.	-32.7	12	6.05E+06	128	0.	1927	0.	-32.7
14	7.61E+06	148	0.	2233	0.		14	3.15E+06	148	0.	2233	0.	
16	7.37E+06	169	0.	2530	0.	FROSTPOINT	16	3.51E+06	169	0.	2530	0.	FROSTPOINT
18	6.38E+06	189	1.82E+03	2843	0.		18	2.04E+06	189	0.	2843	0.	
20	2.95E+05	209	4.95E+03	3149	0.		20	1.81E+06	209	0.	3149	0.	
22	9.80E+05	230	1.42E+04	3454	0.	TAS (M/S)	22	1.34E+06	230	0.	3454	0.	TAS (M/S)
24	2.49E+05	250	1.59E+04	3760	0.	122.6	24	1.87E+06	250	0.	3760	0.	120.4
26	2.71E+05	271	1.91E+04	4065	0.		26	1.41E+06	271	1.31E+03	4065	0.	
28	2.70E+05	291	2.03E+04	4370	0.		28	2.34E+05	291	0.	4370	0.	
30	2.21E+05	311	2.37E+04	4676	0.		30	7.03E+05	311	5.23E+03	4676	0.	
LWC	3.50E-04		1.88E-03		1.74E-04	TOTALS	LWC	1.74E-04		1.76E-04		1.38E-03	TOTALS
MED 0	23		126		177	103	MED 0	21		135		277	276

AFML CIRRUS STUDY 9Y AFGL													
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING													
INTERVAL START 18051000													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.26E+09	26	0.	400	3.91E+01	383.8	2	7.74E+08	26	0.	400	1.86E+02	342.8
4	6.02E+06	47	9.04E+03	706	0.	ALT (KM)	4	5.98E+07	47	3.52E+04	706	3.05E+02	ALT (KM)
6	3.63E+06	67	0.	1011	0.	8.237	6	4.40E+07	67	8.25E+03	1011	7.49E+00	8.256
8	1.98E+06	87	0.	1316	0.		8	3.26E+07	87	0.	1316	0.	
10	4.82E+05	108	0.	1622	0.	TEMP (C)	10	2.08E+07	108	5.01E+03	1622	0.	TEMP (C)
12	1.21E+06	128	0.	1927	0.	-32.6	12	1.59E+07	128	1.24E+03	1927	0.	-32.7
14	1.49E+06	148	0.	2233	0.	FROSTPOINT	14	1.50E+07	148	9.75E+02	2233	0.	FROSTPOINT
16	1.89E+06	169	8.19E+02	2530	0.		16	1.52E+07	169	8.04E+02	2530	0.	
18	1.21E+06	189	0.	2843	0.		18	1.03E+07	189	1.74E+03	2843	0.	
20	0.	209	2.94E+03	3149	0.		20	4.49E+06	209	0.	3149	0.	
22	0.	230	3.23E+03	3454	0.	TAS (M/S)	22	3.58E+06	230	2.08E+03	3454	0.	TAS (M/S)
24	4.82E+05	250	1.20E+03	3760	0.	122.6	24	6.56E+06	250	2.50E+03	3760	0.	120.9
26	7.27E+05	271	2.67E+03	4065	0.		26	3.05E+06	271	2.80E+03	4065	0.	
28	7.28E+05	291	3.07E+03	4370	0.		28	3.28E+06	291	2.97E+03	4370	0.	
30	4.81E+05	311	3.60E+03	4676	0.		30	2.34E+06	311	0.	4676	0.	
LWC	8.59E-05		2.98E-04		3.38E-05	TOTALS	LWC	6.34E-04		2.21E-04		3.15E-03	TOTALS
MED 0	25		125		175	101	MED 0	21		114		240	236



AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START *1819210*						INTERVAL START *1819210*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	1.25E+09	26	0.	4.00	2.31E+02	338.9	2	2.64E+08	26	1.80E+05	4.00	2.64E+02
4	9.64E+06	47	0.	706	1.52E+01	ALT (KM)	4	1.34E+08	47	6.06E+05	706	2.71E+00
6	6.59E+06	67	0.	1011	8.336	8.336	6	9.83E+07	67	1.02E+05	1011	0.
8	4.34E+06	87	2.52E+03	1316	0.	TEMP (C)	8	8.33E+07	87	8.06E+04	1316	0.
10	3.87E+06	107	0.	1622	0.	-33.2	10	6.70E+07	107	1.97E+04	1622	0.
12	4.34E+06	127	0.	1927	0.	FRGSTPOINT	12	6.44E+07	127	5.31E+03	1927	0.
14	1.60E+06	147	0.	2233	0.	-33.5	14	3.82E+07	147	3.14E+03	2233	0.
16	2.18E+06	167	0.	2538	0.	FRGSTPOINT	16	8.03E+07	167	6.04E+03	2538	0.
18	4.83E+05	187	1.79E+03	2843	0.	TAS (M/S)	18	3.67E+07	187	2.51E+04	2843	0.
20	7.23E+05	207	9.81E+02	3149	0.	129.7	20	1.09E+07	207	8.06E+04	3149	0.
22	9.69E+05	227	2.19E+03	3454	0.	TAS (M/S)	22	1.59E+07	227	5.68E+04	3454	0.
24	4.80E+05	247	2.69E+03	3760	0.	119.9	24	1.23E+07	247	5.32E+04	3760	0.
26	4.83E+05	267	2.69E+03	4065	0.	TOTALS	26	1.66E+07	267	5.57E+04	4065	0.
28	9.66E+05	287	3.59E+03	4370	0.	LWC	28	1.10E+07	287	3.34E+04	4370	0.
30	7.23E+05	307	3.59E+03	4676	0.	MED 0	30	1.13E+07	307	2.97E+04	4676	0.
LWC	1.19E-04	22	1.92E-04	132	183	TOTALS	LWC	2.27E-03	22	4.97E-03	114	2.41E-04
MED 0	22	132	199	183	183	TOTALS	MED 0	22	114	179	94	

AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START *1819210*						INTERVAL START *1819210*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	7.63E+08	26	0.	4.00	1.23E+03	339.0	2	1.25E+08	26	3.58E+04	4.00	1.73E+02
4	8.47E+07	47	6.47E+04	706	3.83E+01	ALT (KM)	4	1.00E+08	47	9.64E+05	706	1.63E+00
6	6.06E+07	67	4.37E+03	1011	5.56E-01	8.415	6	1.81E+08	67	1.40E+05	1011	0.
8	8.47E+07	87	0.	1316	0.	TEMP (C)	8	1.40E+08	87	9.14E+04	1316	0.
10	3.52E+07	107	3.51E+03	1622	0.	-33.9	10	1.15E+08	107	4.08E+04	1622	0.
12	3.29E+07	127	0.	1927	0.	FRGSTPOINT	12	6.60E+07	127	5.06E+04	1927	0.
14	2.41E+07	147	2.05E+03	2233	0.	TAS (M/S)	14	6.25E+07	147	6.52E+04	2233	0.
16	1.93E+07	167	0.	2538	0.	129.2	16	8.25E+07	167	5.06E+04	2538	0.
18	1.43E+07	187	4.50E+03	2843	0.	TOTALS	18	5.56E+07	187	8.49E+04	2843	0.
20	9.61E+06	207	8.99E+03	3149	0.	LWC	20	4.16E+07	207	1.19E+05	3149	0.
22	5.67E+06	227	1.32E+04	3454	0.	MED 0	22	2.62E+07	227	1.02E+05	3454	0.
24	4.44E+06	247	3.91E+04	3760	0.	TOTALS	24	2.49E+07	247	6.93E+04	3760	0.
26	5.68E+06	267	5.08E+04	4065	0.	LWC	26	2.34E+07	267	3.74E+04	4065	0.
28	3.21E+06	287	7.67E+04	4370	0.	MED 0	28	2.74E+07	287	3.01E+04	4370	0.
30	3.95E+06	307	4.93E+04	4676	0.	TOTALS	30	2.24E+7	307	1.66E+04	4676	0.
LWC	8.97E-04	20	4.79E-03	126	186	TOTALS	LWC	3.92E-03	23	6.76E-03	180	1.58E-04
MED 0	20	126	186	186	186	TOTALS	MED 0	23	180	176	89	



AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START *10*55*10*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.17E+08	26	0.	400	2.06E+00	330.2	2	8.01E+07	26	1.05E+05	400	1.92E+02	329.0
4	4.09E+07	47	2.19E+05	706	0.	ALT (MM)	4	3.79E+00	47	7.94E+05	706	3.28E+00	ALT (MM)
6	3.32E+07	67	6.55E+04	1011	0.	8.513	6	6.66E+08	67	5.63E+04	1011	0.	8.521
8	2.57E+07	87	4.18E+04	1316	0.		8	6.12E+04	87	3.39E+04	1316	0.	
10	2.48E+07	107	3.54E+04	1622	0.	TEMP (C)	10	4.70E+08	107	1.58E+04	1622	0.	TEMP (C)
12	1.49E+07	127	2.79E+04	1927	0.	-33.9	12	3.03E+08	127	2.22E+04	1927	0.	-33.9
14	1.12E+07	147	1.44E+04	2233	0.		14	2.42E+08	147	1.44E+04	2233	0.	
16	1.64E+07	167	9.39E+03	2538	0.	PRCSTPOINT	16	3.19E+08	167	6.77E+03	2538	0.	PRCSTPOINT
18	7.44E+06	187	5.50E+03	2843	0.		18	2.44E+08	187	8.22E+03	2843	0.	
20	5.49E+06	207	7.01E+03	3149	0.		20	1.04E+08	207	4.97E+03	3149	0.	
22	3.72E+06	227	5.51E+03	3454	0.	TAS (M/S)	22	6.80E+07	227	5.46E+03	3454	0.	TAS (M/S)
24	2.73E+06	247	1.23E+03	3760	0.	121.9	24	4.51E+07	247	2.43E+03	3760	0.	122.7
26	2.57E+06	267	0.	4065	0.		26	3.64E+07	267	4.10E+03	4065	0.	
28	3.57E+06	287	0.	4370	0.		28	3.15E+07	287	1.56E+03	4370	0.	
30	3.22E+06	307	0.	4676	0.	TOTALS	30	2.21E+07	311	7.28E+03	4676	0.	TOTALS
LWC	5.59E-04		6.26E-04		1.78E-06	6.10E-04	LWC	9.59E-03		1.10E-03		1.81E-04	9.44E-04
MEQ 0	21		65		175	84	MEQ 0	19		72		181	63

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START *10*55*10*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	5.91E+08	26	0.	400	0.	330.0	2	1.15E+09	26	0.	400	1.99E+01	329.0
4	2.49E+07	47	5.93E+05	706	0.	ALT (MM)	4	5.99E+07	47	4.59E+05	706	0.	ALT (MM)
6	3.52E+08	67	6.57E+04	1011	0.	8.515	6	4.06E+07	67	6.02E+04	1011	0.	
8	3.59E+08	87	4.93E+04	1316	0.		8	3.59E+07	87	3.10E+04	1316	0.	
10	2.75E+08	107	2.29E+04	1622	0.	TEMP (C)	10	3.25E+07	107	1.74E+04	1622	0.	TEMP (C)
12	2.08E+08	127	1.83E+04	1927	0.	-33.7	12	2.32E+07	127	1.66E+04	1927	0.	34.0
14	1.40E+08	147	1.03E+03	2233	0.		14	1.71E+07	147	9.14E+03	2233	0.	
16	1.89E+08	167	1.170E+03	2538	0.	PRCSTPOINT	16	2.80E+07	167	3.36E+03	2538	0.	PRCSTPOINT
18	1.10E+08	187	0.	2843	0.		18	1.79E+07	187	8.14E+03	2843	0.	
20	4.99E+07	207	0.	3149	0.		20	1.20E+07	207	4.03E+03	3149	0.	
22	3.11E+07	227	2.0	3454	0.	TAS (M/S)	22	6.84E+06	227	2.17E+03	3454	0.	TAS (M/S)
24	2.19E+07	247	0.	3760	0.	122.5	24	7.09E+06	247	2.0	3760	0.	122.4
26	1.82E+07	267	0.	4065	0.		26	6.65E+06	267	0.	4065	0.	
28	1.53E+07	287	0.	4370	0.		28	8.07E+06	287	0.	4370	0.	
30	1.66E+07	307	0.	4676	0.	TOTALS	30	7.34E+06	311	3.64E+03	4676	0.	TOTALS
LWC	4.81E-03		4.62E-04		0.	4.82E-04	LWC	1.17E-03		6.80E-04		1.72E-05	5.31E-04
MEQ 0	17		39		0	33	MEQ 0	23		67		175	53

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 100500Z						INTERVAL START 100500Z					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	4.54E+08	26	6.94E+04	1.26E+01	329.8	2	3.63E+08	26	0.	4.52E+00	330.4
4	1.88E+08	47	9.83E+05	706 0.	ALT (KM)	4	2.21E+08	47	1.10E+06	706 5.20E-01	ALT (KM)
6	1.81E+08	67	1.66E+05	1011 0.	8.521	6	2.17E+08	57	1.51E+05	1011 0.	6.508
8	1.58E+08	37	9.91E+04	1316 0.		8	1.50E+08	37	7.85E+04	1316 0.	
10	1.20E+08	108	5.70E+04	1622 0.	TEMP (C)	10	1.47E+08	108	2.41E+04	1622 0.	TEMP (C)
12	9.58E+07	128	5.12E+04	1927 0.	-33.9	12	1.25E+08	128	2.55E+04	1927 0.	-33.8
14	6.08E+07	143	4.03E+04	2233 0.	FROSTPOINT	14	7.49E+07	143	1.30E+04	2233 0.	FROSTPOINT
16	7.80E+07	169	3.07E+04	2538 0.		16	1.03E+08	169	6.29E+03	2538 0.	
18	6.57E+07	199	5.02E+04	2843 0.		18	8.86E+07	189	6.24E+03	2843 0.	
20	3.92E+07	209	4.11E+04	3149 0.		20	4.50E+07	209	1.17E+04	3149 0.	
22	2.96E+07	230	2.48E+04	3454 0.	TAS (M/S)	22	4.23E+07	230	6.42E+03	3454 0.	TAS (M/S)
24	2.35E+07	250	1.91E+04	3760 0.	124.5	24	2.59E+07	250	5.95E+03	3760 0.	125.1
26	2.13E+07	271	1.21E+04	4065 0.		26	3.62E+07	271	1.33E+03	4065 0.	
28	2.15E+07	291	6.17E+03	4370 0.		28	3.02E+07	291	1.53E+03	4370 0.	
30	2.63E+07	311	5.39E+03	4676 0.	TOTALS	30	1.53E+07	311	1.78E+03	4676 0.	TOTALS
LMC MED 0 22	3.87E-03		2.96E-03	1.09E-05	175	LMC MED 0 22	4.94E-03		1.31E-03	6.41E-06	1.13E-03
			85						52	218	44

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AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 100500Z						INTERVAL START 100500Z					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	6.44E+08	26	3.43E+04	7.43E+00	330.1	2	8.53E+07	26	7.00E+04	1.51E+02	330.7
4	1.21E+08	47	6.89E+05	706 0.	ALT (KM)	4	3.43E+08	47	1.53E+06	706 5.20E+00	ALT (KM)
6	1.07E+08	67	6.74E+04	1011 0.	8.515	6	3.97E+08	57	1.21E+05	1011 0.	8.502
8	9.24E+07	37	7.09E+04	1316 0.		8	3.11E+08	37	9.50E+04	1316 0.	
10	6.79E+07	108	2.57E+04	1622 0.	TEMP (C)	10	2.42E+08	108	6.19E+04	1622 0.	TEMP (C)
12	5.20E+07	128	2.41E+04	1927 0.	-33.9	12	2.05E+08	128	2.55E+04	1927 0.	-33.5
14	3.51E+07	144	1.70E+04	2233 0.	FROSTPOINT	14	1.31E+08	143	1.12E+04	2233 0.	FROSTPOINT
16	4.39E+07	169	1.57E+04	2538 0.		16	1.65E+08	169	1.89E+04	2538 0.	
18	4.06E+07	199	1.87E+04	2843 0.		18	1.26E+08	193	2.00E+04	2843 0.	
20	2.30E+07	209	2.33E+04	3149 0.		20	6.93E+07	209	3.57E+04	3149 0.	
22	1.52E+07	230	1.60E+04	3454 0.	TAS (M/S)	22	6.09E+07	230	2.51E+04	3454 0.	TAS (M/S)
24	1.27E+07	250	9.92E+03	3760 0.	129.7	24	3.62E+07	250	1.44E+04	3760 0.	123.4
26	1.87E+07	271	4.01E+03	4065 0.		26	4.09E+07	271	1.63E+04	4065 0.	
28	1.80E+07	291	1.53E+03	4370 0.		28	3.54E+07	291	1.49E+04	4370 0.	
30	1.06E+07	311	0.	4676 0.	TOTALS	30	2.67E+07	311	1.09E+04	4676 0.	TOTALS
LMC MED 0 22	2.41E-03		1.36E-03	6.47E-06	175	LMC MED 0 22	7.05E-03		2.95E-03	1.59E-04	2.00E-03
			81						83	189	60

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING													
INTERVAL START 110510Z													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.26E+07	25	7.07E+04	400	1.86E+02	330.9	2	3.94E+07	25	1.06E+05	400	1.40E+02	330.6
4	4.12E+08	47	1.01E+06	706	2.15E+00	ALT (KM)	4	5.70E+08	47	8.72E+05	706	2.15E+00	ALT (KM)
6	4.87E+08	67	8.73E+04	1011	0.	0.499	6	1.17E+09	67	5.24E+04	1011	0.	0.505
8	4.12E+08	47	7.29E+04	1316	0.		8	1.02E+09	47	4.43E+04	1316	0.	
10	3.11E+08	104	1.77E+04	1622	0.	TEMP (C)	10	7.38E+08	104	2.12E+04	1622	0.	TEMP (C)
12	2.51E+08	123	2.75E+04	1927	0.	-33.4	12	5.96E+08	123	5.82E+04	1927	0.	-33.3
14	1.45E+08	144	2.79E+04	2233	0.		14	3.44E+08	143	6.19E+04	2233	0.	
16	1.99E+08	159	3.06E+04	2538	0.	FRESHPOINT	16	4.25E+08	159	5.44E+04	2538	0.	FRESHPOINT
18	1.47E+08	189	7.72E+04	2843	0.		18	2.78E+08	189	9.18E+04	2843	0.	
20	7.58E+07	209	9.42E+04	3149	0.		20	1.23E+09	209	7.61E+04	3149	0.	
22	6.10E+07	239	9.15E+04	3454	0.	TAS (M/S)	22	8.92E+07	239	5.95E+04	3454	0.	TAS (M/S)
24	4.74E+07	259	4.65E+04	3760	0.	121.8	24	6.09E+07	259	5.18E+04	3760	0.	121.9
26	4.56E+07	271	4.27E+04	4065	0.		26	5.15E+07	271	2.34E+04	4065	0.	
28	4.04E+07	291	2.68E+04	4370	0.		28	4.14E+07	291	2.04E+04	4370	0.	
30	2.55E+07	311	9.18E+03	4676	0.	TOTALS	30	2.53E+07	311	3.67E+03	4676	0.	TOTALS
LWC	7.39E-03		5.50E-03		1.71E-04	3.41E-03	LWC	1.27E-02		4.74E-03		1.31E-04	3.17E-03
MED 0	21		100		179	90	MED 0	14		95		191	05

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 110510Z													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.59E+07	25	7.13E+04	400	5.28E+01	330.8	2	4.48E+07	25	7.05E+04	400	2.99E+02	330.2
4	4.17E+08	47	1.10E+06	706	0.	ALT (KM)	4	6.14E+08	47	3.70E+05	706	9.66E+00	ALT (KM)
6	5.14E+08	67	1.10E+05	1011	0.	0.500	6	1.73E+09	67	2.60E+04	1011	0.	0.512
8	4.07E+08	87	6.81E+04	1316	0.		8	1.43E+09	87	6.14E+04	1316	0.	
10	3.14E+08	108	4.63E+04	1622	0.	TEMP (C)	10	9.56E+08	103	7.69E+04	1622	0.	TEMP (C)
12	2.51E+08	128	4.46E+04	1927	0.	-33.4	12	7.11E+08	124	4.94E+04	1927	0.	-33.4
14	1.55E+08	148	4.62E+04	2233	0.		14	3.09E+08	148	6.35E+04	2233	0.	
16	2.01E+08	167	7.28E+04	2538	0.	FRESHPOINT	16	4.34E+08	169	4.56E+04	2538	0.	FRESHPOINT
18	1.54E+08	188	1.23E+05	2843	0.		18	2.54E+08	189	7.94E+04	2843	0.	
20	7.59E+07	209	1.00E+05	3149	0.		20	1.61E+08	209	7.37E+04	3149	0.	
22	3.87E+07	239	2.98E+04	3454	0.	TAS (M/S)	22	7.34E+07	239	5.04E+04	3454	0.	TAS (M/S)
24	4.52E+07	271	2.50E+04	4065	0.	121.8	24	5.12E+07	271	3.84E+04	4065	0.	121.6
26	4.34E+07	291	1.43E+04	4370	0.		26	4.28E+07	291	2.89E+04	4370	0.	
30	2.05E+07	311	5.54E+03	4676	0.	TOTALS	30	1.85E+07	311	2.01E+04	4676	0.	TOTALS
LWC	7.60E-03		5.29E-03		4.57E-05	4.00E-03	LWC	1.25E-02		5.01E-03		3.04E-04	2.94E-03
MED 0	20		90		179	84	MED 0	16		103		107	07

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 191000Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER (MU)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER (MU)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)
2	9.40E+07	26	6.98E+04	400	1.04E+02	2	6.96E+03	26	7.87E+02
4	6.34E+08	47	2.83E+05	706	2.11E+00	4	1.04E+08	47	2.80E+05
6	1.08E+09	67	4.28E+04	1011	0.	6	7.04E+07	67	4.21E+04
8	9.36E+08	37	2.04E+04	1316	0.	8	6.20E+07	37	4.20E+04
10	6.66E+08	104	3.12E+04	1622	0.	10	4.59E+07	104	8.54E+03
12	5.06E+08	128	4.88E+04	1927	0.	12	3.59E+07	128	1.56E+03
14	2.92E+08	143	2.53E+04	2233	0.	14	2.71E+07	143	1.98E+03
16	3.43E+08	169	2.75E+04	2538	0.	16	2.52E+07	169	1.67E+03
18	2.16E+08	189	5.13E+04	2843	0.	18	3.00E+07	189	5.33E+03
20	9.22E+07	209	3.63E+04	3149	0.	20	1.44E+07	209	1.16E+04
22	4.94E+07	230	3.24E+04	3454	0.	22	1.22E+07	230	2.52E+04
24	3.60E+07	250	1.56E+04	3760	0.	24	1.08E+07	250	3.91E+04
26	2.99E+07	271	1.35E+04	4065	0.	26	1.00E+07	271	3.05E+04
28	1.97E+07	291	1.54E+04	4370	0.	28	9.34E+06	291	3.96E+04
30	9.74E+06	311	5.40E+03	4676	0.	30	8.87E+06	311	2.13E+04
LWC	9.14E-03	2.57E-03	96	1.00E-04	182	LWC	1.63E-03	3.22E-03	8.24E-04
MEAN	16	95				MEAN	22	120	189
TOTALS									
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 191000Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER (MU)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER (MU)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)
2	3.67E+08	26	3.40E+04	400	8.85E+02	2	2.76E+03	26	4.86E+02
4	1.90E+08	47	9.38E+04	706	9.96E+01	4	2.02E+03	47	7.62E+05
6	1.56E+08	67	5.46E+04	1011	2.72E+00	6	2.94E+03	67	6.48E+04
8	1.40E+08	37	3.50E+04	1316	0.	8	2.59E+03	37	1.53E+04
10	1.01E+08	104	1.76E+04	1622	0.	10	1.98E+03	104	1.74E+03
12	7.89E+07	128	8.68E+03	1927	0.	12	1.60E+03	128	3.86E+03
14	5.29E+07	143	6.98E+03	2233	0.	14	1.02E+03	143	2.05E+03
16	6.07E+07	169	7.41E+03	2538	0.	16	1.34E+03	169	2.53E+03
18	5.93E+07	189	3.46E+04	2843	0.	18	9.44E+02	189	1.36E+04
20	3.28E+07	209	6.29E+03	3149	0.	20	5.07E+02	209	2.74E+04
22	2.70E+07	230	6.91E+03	3454	0.	22	3.52E+02	230	2.83E+04
24	2.63E+07	250	5.90E+03	3760	0.	24	3.09E+02	250	2.86E+04
26	1.84E+07	271	6.24E+03	4065	0.	26	2.99E+02	271	3.27E+04
28	1.87E+07	291	3.64E+04	4370	0.	28	2.59E+02	291	2.49E+04
30	1.12E+07	311	2.65E+04	4676	0.	30	1.67E+02	311	2.72E+04
LWC	3.09E-03	5.40E-03	113	1.09E-03	203	LWC	5.03E-03	3.24E-03	4.71E-04
MEAN	21	113				MEAN	20	110	189
TOTALS									
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 191000Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER (MU)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	SCATTER (MU)	SIZE (MU)	CLOUD PROBE	SIZE (MU)	P (MB)
2	3.67E+08	26	3.40E+04	400	8.85E+02	2	2.76E+03	26	4.86E+02
4	1.90E+08	47	9.38E+04	706	9.96E+01	4	2.02E+03	47	7.62E+05
6	1.56E+08	67	5.46E+04	1011	2.72E+00	6	2.94E+03	67	6.48E+04
8	1.40E+08	37	3.50E+04	1316	0.	8	2.59E+03	37	1.53E+04
10	1.01E+08	104	1.76E+04	1622	0.	10	1.98E+03	104	1.74E+03
12	7.89E+07	128	8.68E+03	1927	0.	12	1.60E+03	128	3.86E+03
14	5.29E+07	143	6.98E+03	2233	0.	14	1.02E+03	143	2.05E+03
16	6.07E+07	169	7.41E+03	2538	0.	16	1.34E+03	169	2.53E+03
18	5.93E+07	189	3.46E+04	2843	0.	18	9.44E+02	189	1.36E+04
20	3.28E+07	209	6.29E+03	3149	0.	20	5.07E+02	209	2.74E+04
22	2.70E+07	230	6.91E+03	3454	0.	22	3.52E+02	230	2.83E+04
24	2.63E+07	250	5.90E+03	3760	0.	24	3.09E+02	250	2.86E+04
26	1.84E+07	271	6.24E+03	4065	0.	26	2.99E+02	271	3.27E+04
28	1.87E+07	291	3.64E+04	4370	0.	28	2.59E+02	291	2.49E+04
30	1.12E+07	311	2.65E+04	4676	0.	30	1.67E+02	311	2.72E+04
LWC	3.09E-03	5.40E-03	113	1.09E-03	203	LWC	5.03E-03	3.24E-03	4.71E-04
MEAN	21	113				MEAN	20	110	189
TOTALS									



AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 19102100													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.80E+08	26	1.06E+05	400	3.83E+02	330.1	2	3.00E+08	26	3.53E+04	400	5.58E+01	330.5
4	2.59E+08	47	9.25E+05	706	1.18E+01	ALT (MM)	4	2.70E+08	47	9.57E+05	706	2.36E-01	ALT (MM)
6	2.46E+08	57	9.59E+04	1011	0.	8.514	6	3.02E+08	57	9.16E+04	1011	0.	8.507
8	2.14E+08	97	2.85E+04	1316	0.		8	2.50E+08	97	6.23E+04	1316	0.	
10	1.60E+08	109	5.28E+03	1622	0.	TEMP (C)	10	1.86E+08	109	2.65E+04	1622	0.	TEMP (C)
12	1.49E+08	123	5.21E+03	1927	0.	-34.2	12	1.39E+08	123	1.96E+04	1927	0.	-34.2
14	9.02E+07	149	2.05E+03	2233	0.		14	9.57E+07	149	6.18E+03	2233	0.	
16	1.10E+08	169	8.45E+02	2538	0.	FRGSTOPPOINT	16	1.31E+08	169	2.54E+03	2538	0.	FRGSTOPPOINT
18	1.02E+08	199	1.62E+03	2843	0.		18	9.49E+07	199	5.51E+03	2843	0.	
20	4.59E+07	209	6.98E+03	3149	0.		20	9.40E+07	209	9.00E+02	3149	0.	
22	4.54E+07	230	1.10E+04	3454	0.	TAS (M/S)	22	4.28E+07	230	1.10E+03	3454	0.	TAS (M/S)
24	3.53E+07	250	7.50E+03	3760	0.	122.5	24	3.64E+07	250	0.	3760	0.	122.5
26	3.50E+07	271	2.05E+04	4065	0.		26	3.22E+07	271	1.36E+03	4065	0.	
28	2.86E+07	291	2.19E+04	4370	0.		28	3.19E+07	291	0.	4370	0.	
30	2.00E+07	311	2.01E+04	4676	0.		30	1.95E+07	311	3.67E+03	4676	0.	
TOTALS							TOTALS						
LWC	5.17E-03	2.21E-03	1.87E-04	106	0.7		LWC	5.37E-03	8.73E-04	44	5.08E-05	8.00E-04	46
MED	0	121					MED	0	21		179		

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 19102100													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.69E+08	26	3.52E+04	400	1.22E+02	330.4	2	3.17E+08	26	0.	400	8.36E+01	330.7
4	2.77E+08	47	9.82E+05	706	1.61E+00	ALT (MM)	4	2.64E+08	47	6.73E+05	706	1.08E+00	ALT (MM)
6	3.03E+08	57	9.56E+04	1011	0.	8.509	6	2.55E+08	57	4.38E+04	1011	0.	8.503
8	2.70E+08	97	6.73E+04	1316	0.		8	2.30E+08	97	3.14E+04	1316	0.	
10	2.03E+08	109	2.29E+04	1622	0.	TEMP (C)	10	1.86E+08	109	2.31E+04	1622	0.	TEMP (C)
12	1.70E+08	123	1.50E+04	1927	0.	-34.2	12	1.82E+08	123	2.11E+04	1927	0.	-34.0
14	1.11E+08	149	3.08E+03	2233	0.		14	9.56E+07	149	4.05E+04	2233	0.	
16	1.37E+08	169	2.54E+03	2538	0.	FRGSTOPPOINT	16	1.22E+08	169	1.97E+04	2538	0.	FRGSTOPPOINT
18	1.06E+08	199	9.14E+02	2843	0.		18	9.51E+07	199	2.96E+04	2843	0.	
20	8.59E+07	209	9.97E+02	3149	0.		20	4.53E+07	209	2.42E+04	3149	0.	
22	3.52E+07	230	2.19E+03	3454	0.	TAS (M/S)	22	3.79E+07	230	1.99E+04	3454	0.	TAS (M/S)
24	3.53E+07	250	2.44E+03	3760	0.	122.5	24	2.95E+07	250	1.47E+04	3760	0.	122.5
26	2.59E+07	271	4.11E+03	4065	0.		26	3.06E+07	271	1.24E+04	4065	0.	
28	2.67E+07	291	1.56E+03	4370	0.		28	2.89E+07	291	7.69E+03	4370	0.	
30	1.48E+07	311	9.13E+03	4676	0.		30	1.82E+07	311	9.21E+03	4676	0.	
TOTALS							TOTALS						
LWC	5.23E-03	1.10E-03	1.13E-04	180	0.4		LWC	4.54E-03	2.16E-03	95	7.74E-05	1.40E-03	46
MED	0	93					MED	0	21		166		



AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START +1904+10*						INTERVAL START +1905+10*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	3.71E+08	26	3.58E+04	400	2.45E+02	330.7	2	4.86E+08	26	1.09E+05	400	5.05E+02
4	2.30E+08	47	5.57E+05	706	2.73E+00	ALT (KM)	4	2.18E+08	47	4.81E+05	706	6.20E+00
6	1.51E+08	57	4.43E+04	1011	0.	8.503	6	1.51E+08	57	5.82E+04	1011	0.
8	1.77E+08	97	2.11E+04	1316	0.	TEMP (C)	8	1.56E+08	97	3.47E+04	1316	0.
10	1.38E+08	108	1.44E+04	1622	0.	-16.0	10	1.17E+08	108	3.26E+04	1622	0.
12	1.07E+08	128	4.52E+04	1927	0.	FRCSPOINT	12	9.06E+07	128	3.69E+04	1927	0.
14	7.05E+07	143	7.43E+04	2233	0.	0.	14	6.04E+07	143	4.54E+04	2233	0.
16	9.41E+07	163	9.19E+04	2538	0.	FRCSPOINT	16	8.39E+07	163	5.79E+04	2538	0.
18	6.82E+07	183	1.27E+05	2843	0.	0.	18	6.12E+07	183	1.16E+05	2843	0.
20	4.25E+07	203	1.41E+05	3149	0.	TAS (M/S)	20	3.39E+07	203	1.40E+05	3149	0.
22	3.12E+07	223	7.95E+04	3454	0.	119.9	22	3.25E+07	223	1.46E+05	3454	0.
24	2.42E+07	243	7.09E+04	3760	0.	0.	24	2.10E+07	243	1.30E+05	3760	0.
26	2.39E+07	271	3.50E+04	4065	0.	0.	26	2.16E+07	271	9.03E+04	4065	0.
28	2.77E+07	291	2.24E+04	4370	0.	0.	28	2.44E+07	291	7.50E+04	4370	0.
30	1.65E+07	311	9.34E+03	4676	0.	TOTALS	30	1.80E+07	311	2.63E+04	4676	0.
LWC	4.02E-03	6.44E-03	2.25E-04	179	86	TOTALS	LWC	3.85E-03	9.92E-03	4.76E-04	191	93
MEAN	21	96	179	86	86	MEAN	22	108	191	93	93	

AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START +1904+10*						INTERVAL START +1905+10*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	1.66E+08	26	1.08E+05	400	3.45E+02	332.3	2	8.51E+08	26	0.	400	1.41E+03
4	4.47E+08	47	6.92E+05	706	1.10E+01	ALT (KM)	4	1.21E+08	47	9.44E+04	706	7.41E+01
6	4.76E+08	57	4.01E+04	1011	0.	6.490	6	9.27E+07	57	0.	1011	1.17E+00
8	4.21E+08	97	3.16E+04	1316	0.	TEMP (C)	8	8.44E+07	97	1.00E+04	1316	0.
10	3.08E+08	108	4.69E+04	1622	0.	-33.9	10	5.03E+07	108	1.81E+03	1622	0.
12	2.74E+08	128	6.07E+04	1927	0.	FRCSPOINT	12	4.54E+07	128	2.72E+03	1927	0.
14	1.67E+08	143	1.07E+05	2233	0.	0.	14	2.72E+07	143	5.34E+03	2233	0.
16	2.17E+08	163	7.02E+04	2538	0.	FRCSPOINT	16	3.59E+07	163	1.50E+04	2538	0.
18	1.65E+08	183	1.15E+05	2843	0.	0.	18	2.72E+07	183	6.09E+04	2843	0.
20	7.71E+07	203	6.28E+04	3149	0.	TAS (M/S)	20	1.21E+07	203	7.47E+04	3149	0.
22	5.84E+07	223	4.72E+04	3454	0.	119.4	22	1.03E+07	223	7.99E+04	3454	0.
24	3.62E+07	243	3.37E+04	3760	0.	0.	24	6.94E+06	243	5.32E+04	3760	0.
26	3.64E+07	271	4.91E+04	4065	0.	0.	26	7.67E+06	271	5.70E+04	4065	0.
28	3.21E+07	291	3.37E+04	4370	0.	0.	28	1.00E+07	291	4.73E+04	4370	0.
30	1.50E+07	311	2.43E+04	4676	0.	TOTALS	30	4.36E+06	311	4.36E+04	4676	0.
LWC	7.55E-03	6.10E-03	3.50E-04	107	107	TOTALS	LWC	1.44E-03	6.05E-03	1.54E-03	195	102
MEAN	19	100	107	107	107	MEAN	20	116	195	102	102	

AFML CIRRUS STUDY BY AFGL									
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL				
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START *19105110*					INTERVAL START *19107410*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.19E+09	26	0.	5.59E+02	2	1.27E+09	26	7.26E+04	4.59E+02
4	8.91E+07	47	8.71E+04	706	4	9.32E+07	47	2.67E+04	706
6	5.46E+07	57	4.54E+03	1011	6	6.83E+07	57	1.35E+04	1011
8	5.28E+07	97	2.71E+03	1316	8	5.20E+07	97	5.36E+03	1316
10	3.30E+07	103	9.18E+03	1622	10	3.36E+07	103	0.	1622
12	3.37E+07	128	6.79E+03	1927	12	2.70E+07	128	2.68E+03	1927
14	2.27E+07	143	1.18E+04	2233	14	1.91E+07	143	2.82E+04	2233
16	2.56E+07	169	2.30E+04	2538	16	2.17E+07	169	1.83E+04	2538
18	1.44E+07	199	4.96E+04	2843	18	1.27E+07	199	4.52E+04	2843
20	1.13E+07	209	5.31E+04	3149	20	9.37E+06	209	6.59E+04	3149
22	8.50E+06	230	6.30E+04	3454	22	6.63E+06	230	7.24E+04	3454
24	7.22E+06	250	3.82E+04	3760	24	6.37E+06	250	5.04E+04	3760
26	6.46E+06	271	5.01E+04	4065	26	5.60E+06	271	4.39E+04	4065
28	7.74E+06	291	2.82E+04	4370	28	5.35E+06	291	3.89E+04	4370
30	2.83E+06	311	1.91E+04	4676	30	4.08E+06	311	2.08E+04	4676
LWC	1.09E-03		4.22E-03	112	LWC	9.59E-04		4.78E-03	112
MEAN	21		197	98	MEAN	21		165	97
TOTALS					TOTALS				
				332.0					331.1
				ALT (KM)					ALT (KM)
				8.477					8.494
				TEMP (C)					TEMP (C)
				-34.1					-35.4
				FRGSTPOINT					FRGSTPOINT
				TAS (M/S)					TAS (M/S)
				117.4					120.4
				TOTALS					TOTALS
				2.38E-03					2.19E-04
				100					107
				111					113
				196					167
				96					96

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 191010Z					INTERVAL START 191010Z				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-NM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	2.46E+09	26	0.	1.95E+02	330.7	2	1.93E+09	26	0.
4	1.8E+07	47	0.	2.09E+01	8.502	4	5.08E+07	47	2.78E+04
6	3.56E+06	57	0.	0.	0.	6	3.22E+07	57	0.
8	4.20E+06	67	2.59E+03	0.	0.	8	2.6E+07	67	0.
10	3.70E+06	104	0.	0.	TEMP (C)	10	1.62E+07	104	0.
12	1.48E+06	123	1.31E+03	0.	-33.4	12	1.21E+07	123	0.
14	9.86E+05	144	0.	0.	FROSTPOINT	14	8.70E+06	144	1.00E+03
16	1.59E+06	169	0.	0.	0.	16	8.23E+06	169	0.
18	0.	139	0.	0.	0.	18	8.47E+06	139	0.
20	2.48E+05	219	0.	0.	0.	20	3.2E+06	219	0.
22	1.24E+06	270	1.10E+03	0.	TAS (M/S)	22	4.84E+06	270	1.07E+03
24	0.	250	0.	0.	121.9	24	2.8E+06	250	1.3E+04
26	2.46E+05	271	1.37E+03	0.	0.	26	3.79E+06	271	2.02E+04
28	2.49E+05	291	1.57E+03	0.	0.	28	2.91E+06	291	1.38E+04
30	9.86E+05	311	0.	0.	0.	30	2.42E+06	311	1.61E+04
LWC	9.47E-05	7.66E-05	121	216	207	LWC	5.14E-04	1.32E-03	198
MED D	21	21	125	186	207	MED D	22	125	198
TOTALS					207	TOTALS			
2.87E-04					207	2.87E-04			
2.87E-04					207	2.87E-04			
2.87E-04					207	2.87E-04			
2.87E-04					207	2.87E-04			
2.87E-04					207	2.87E-04			
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2.87E-04					207	2.87E-04			
2.87E-04					207	2.87E-04			
2.87E-04					207	2.87E-04			

APWL CIRCUIS STUDY 9Y AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 19110110													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: GULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.06E+09	26	3.44E+04	400	6.03E+02	329.9	2	9.72E+08	26	1.74E+05	400	8.56E+02	329.2
4	1.28E+08	47	7.24E+04	706	9.96E+01	8.519	4	1.43E+08	47	1.08E+05	706	2.23E+01	8.513
6	8.20E+07	57	4.25E+03	1011	0.	0.	6	1.03E+08	57	4.32E+03	1011	5.53E-01	0.
8	6.63E+07	87	1.27E+04	1316	0.	0.	8	6.03E+07	87	7.59E+03	1316	0.	0.
10	4.92E+07	109	1.03E+04	1622	0.	0.	10	5.91E+07	109	2.78E+04	1622	0.	0.
12	4.32E+07	129	2.17E+04	1927	0.	0.	12	4.22E+07	129	3.22E+04	1927	0.	0.
14	2.85E+07	149	4.01E+04	2233	0.	0.	14	2.85E+07	149	3.14E+04	2233	0.	0.
16	2.77E+07	169	4.95E+04	2538	0.	0.	16	4.29E+07	169	4.32E+04	2538	0.	0.
18	2.70E+07	189	9.74E+04	2843	0.	0.	18	2.44E+07	189	9.08E+04	2843	0.	0.
20	1.37E+07	209	9.26E+04	3149	0.	0.	20	1.68E+07	209	8.68E+04	3149	0.	0.
22	1.29E+07	229	7.40E+04	3454	0.	0.	22	1.29E+07	229	9.44E+04	3454	0.	0.
24	1.11E+07	250	5.43E+04	3760	0.	0.	24	1.03E+07	250	6.78E+04	3760	0.	0.
26	7.48E+06	271	5.95E+04	4065	0.	0.	26	8.59E+06	271	7.20E+04	4065	0.	0.
28	9.16E+06	291	3.52E+04	4370	0.	0.	28	8.30E+06	291	5.74E+04	4370	0.	0.
30	8.20E+06	311	3.04E+04	4676	0.	0.	30	6.43E+06	311	3.98E+04	4676	0.	0.
LWC	1.56E-03	22	6.32E-03	109	5.69E-04	141	LWC	1.61E-03	21	7.51E-03	113	9.54E-04	105
MEAN	0	0	0	0	0	0	MEAN	0	0	0	0	0	0
TOTALS	3.32E-03	93	3.32E-03	93	3.32E-03	93	TOTALS	3.32E-03	93	3.32E-03	93	3.32E-03	93

APWL CIRCUIS STUDY 9Y AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 19110110													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: GULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.25E+08	25	2.07E+05	400	6.88E+02	330.1	2	1.59E+09	25	7.04E+04	400	1.04E+03	330.6
4	1.55E+08	47	5.65E+04	706	1.79E+01	8.515	4	9.77E+07	47	4.62E+04	706	3.47E+01	8.505
6	9.65E+07	57	1.28E+04	1011	0.	0.	6	6.65E+07	57	1.73E+04	1011	1.60E+00	0.
8	4.68E+07	87	5.07E+03	1316	0.	0.	8	4.92E+07	87	0.	1316	0.	0.
10	6.45E+07	109	1.72E+04	1622	0.	0.	10	3.50E+07	109	5.26E+03	1622	0.	0.
12	4.73E+07	129	3.42E+04	1927	0.	0.	12	3.29E+07	129	2.29E+03	1927	0.	0.
14	2.66E+07	149	5.12E+04	2233	0.	0.	14	1.65E+07	149	1.33E+04	2233	0.	0.
16	3.41E+07	169	7.29E+04	2538	0.	0.	16	2.82E+07	169	3.30E+03	2538	0.	0.
18	2.85E+07	189	1.82E+05	2843	0.	0.	18	1.92E+07	189	3.38E+04	2843	0.	0.
20	1.60E+07	209	1.29E+05	3149	0.	0.	20	7.86E+06	209	5.64E+04	3149	0.	0.
22	1.45E+07	229	1.06E+05	3454	0.	0.	22	9.10E+06	229	5.04E+04	3454	0.	0.
24	7.53E+06	250	8.02E+04	3760	0.	0.	24	6.64E+06	250	4.67E+04	3760	0.	0.
26	6.77E+06	271	7.26E+04	4065	0.	0.	26	6.39E+06	271	3.29E+04	4065	0.	0.
28	9.42E+06	291	4.92E+04	4370	0.	0.	28	5.41E+06	291	4.38E+04	4370	0.	0.
30	5.80E+06	311	2.87E+04	4676	0.	0.	30	5.17E+06	311	2.73E+04	4676	0.	0.
LWC	1.55E-03	21	8.06E-03	107	6.80E-04	165	LWC	1.07E-03	21	4.30E-03	115	1.12E-03	103
MEAN	0	0	0	0	0	0	MEAN	0	0	0	0	0	0
TOTALS	3.32E-03	93	3.32E-03	93	3.32E-03	93	TOTALS	3.32E-03	93	3.32E-03	93	3.32E-03	93

85



AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 191110Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	0.48E+08	26	2.13E+05	400	1.41E+03	2	1.05E+09	25	1.75E+05
4	1.66E+08	47	7.46E+04	706	6.25E+01	4	1.41E+09	47	6.50E+04
6	1.13E+08	67	3.93E+04	1011	1.13E+00	6	9.18E+07	67	1.30E+04
8	9.70E+07	87	5.20E+03	1316	0.	8	7.08E+07	87	1.00E+04
10	6.50E+07	108	8.66E+03	1622	0.	10	5.71E+07	108	1.23E+04
12	5.58E+07	128	3.41E+04	1927	0.	12	4.58E+07	128	3.84E+04
14	3.72E+07	148	5.37E+04	2233	0.	14	2.63E+07	148	8.00E+04
16	4.49E+07	169	5.11E+04	2538	0.	16	3.79E+07	169	5.07E+04
18	3.47E+07	189	1.53E+05	2843	0.	18	2.46E+07	189	1.15E+05
20	1.89E+07	209	1.31E+05	3149	0.	20	1.23E+07	209	1.31E+05
22	1.51E+07	230	1.16E+05	3454	0.	22	1.53E+07	230	9.64E+04
24	1.44E+07	250	6.98E+04	3760	0.	24	1.11E+07	250	7.18E+04
26	1.41E+07	271	5.79E+04	4065	0.	26	1.20E+07	271	6.29E+04
28	9.43E+06	291	4.88E+04	4370	0.	28	9.46E+06	291	3.76E+04
30	6.69E+06	311	4.05E+04	4676	0.	30	9.13E+06	311	2.37E+04
TOTALS					330.8	TOTALS			
LWC	1.50E-03	8.22E-03	1.53E-03	5.58E-03	96	LWC	1.74E-03	7.55E-03	4.23E-03
MED D	21	106	102	109	94	MED D	22	104	141
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 191110Z									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.07E+09	26	3.56E+04	400	7.05E+02	2	8.68E+08	25	1.07E+05
4	1.52E+08	47	1.12E+05	706	1.19E+01	4	1.74E+08	47	1.41E+05
6	1.05E+08	67	1.32E+04	1011	0.	6	1.16E+08	67	5.29E+04
8	8.66E+07	87	1.03E+04	1316	0.	8	1.05E+08	87	3.66E+04
10	6.36E+07	108	1.07E+04	1622	0.	10	7.30E+07	108	2.67E+04
12	4.77E+07	128	1.98E+04	1927	0.	12	5.80E+07	128	5.06E+04
14	3.17E+07	148	4.05E+04	2233	0.	14	3.80E+07	148	6.02E+04
16	4.32E+07	169	3.94E+04	2538	0.	16	5.10E+07	169	4.53E+04
18	3.59E+07	189	1.33E+05	2843	0.	18	3.45E+07	189	7.86E+04
20	1.50E+07	209	1.27E+05	3149	0.	20	2.15E+07	209	6.97E+04
22	1.67E+07	230	1.29E+05	3454	0.	22	1.85E+07	230	7.22E+04
24	1.10E+07	250	9.24E+04	3760	0.	24	1.33E+07	250	6.91E+04
26	1.12E+07	271	9.43E+04	4065	0.	26	1.52E+07	271	7.49E+04
28	1.20E+07	291	9.54E+04	4370	0.	28	1.49E+07	291	4.42E+04
30	6.99E+06	311	3.33E+04	4676	0.	30	8.59E+06	311	1.85E+04
TOTALS					330.7	TOTALS			
LWC	1.52E-03	8.96E-03	1.53E-03	6.67E-04	94	LWC	2.27E-03	6.61E-03	9.42E-04
MED D	21	109	101	109	94	MED D	22	109	191



AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
INTERVAL START \*19114100\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	4.64E+08	26	7.20E+04	400	1.54E+03	326.4
4	3.41E+08	47	1.81E+05	706	7.87E+01	ALT (MM)
6	3.82E+08	67	1.55E+05	1011	1.72E+00	6.592
8	3.17E+08	87	9.77E+04	1316	0.	
10	2.56E+08	108	5.86E+04	1622	0.	TEMP (C)
12	1.98E+08	128	8.37E+04	1927	0.	-34.1
14	1.27E+08	149	5.55E+04	2233	0.	
16	1.69E+08	169	4.59E+04	2538	0.	FRGSTOPPOINT
18	1.32E+08	189	6.71E+04	2843	0.	
20	7.59E+07	209	5.70E+04	3149	0.	
22	5.97E+07	230	5.26E+04	3454	0.	TAS (M/S)
24	3.58E+07	250	5.59E+04	3760	0.	120.0
26	4.21E+07	271	4.76E+04	4065	0.	
28	3.90E+07	291	3.88E+04	4370	0.	
30	2.44E+07	311	4.87E+04	4676	0.	
LWC	7.10E-03		6.78E-03		1.73E-03	TOTALS
MED D	21		108		195	94

AFML CIRRHUS STUDY BY AFGL

FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING  
INTERVAL START \*19115100\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.10E+08	26	2.16E+05	400	1.68E+02	321.9
4	3.59E+08	47	1.39E+06	706	2.74E+00	ALT (MM)
6	3.55E+08	67	2.66E+05	1011	0.	8.685
8	3.10E+08	87	2.96E+05	1316	0.	
10	2.20E+08	108	8.80E+04	1622	0.	TEMP (C)
12	1.86E+08	128	9.86E+04	1927	0.	-34.0
14	1.24E+08	148	6.50E+04	2233	0.	
16	1.49E+08	169	3.37E+04	2538	0.	FRGSTOPPOINT
18	1.40E+08	189	6.16E+04	2843	0.	
20	7.39E+07	209	9.92E+04	3149	0.	
22	5.39E+07	230	3.36E+04	3454	0.	TAS (M/S)
24	4.89E+07	250	3.80E+04	3760	0.	119.9
26	4.68E+07	271	2.80E+04	4065	0.	
28	4.19E+07	291	2.40E+04	4370	0.	
30	2.82E+07	311	3.74E+03	4676	0.	
LWC	7.24E-03		4.87E-03		1.58E-04	TOTALS
MED D	21		87		101	74

INTERVAL START \*19114100\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.15E+08	26	1.80E+05	400	1.09E+03	324.0
4	3.11E+08	47	1.11E+06	706	7.58E+01	ALT (MM)
6	4.56E+08	67	1.11E+05	1011	1.72E+00	8.642
8	3.79E+08	87	1.01E+05	1316	6.07E+01	
10	3.10E+08	108	5.03E+04	1622	0.	TEMP (C)
12	2.38E+08	128	3.75E+04	1927	0.	-34.6
14	1.54E+08	149	4.72E+04	2233	0.	
16	2.26E+08	169	2.16E+04	2538	0.	FRGSTOPPOINT
18	1.70E+08	189	3.55E+04	2843	0.	
20	8.58E+07	209	5.30E+04	3149	0.	
22	6.11E+07	230	2.74E+04	3454	0.	TAS (M/S)
24	4.50E+07	250	2.74E+04	3760	0.	119.0
26	4.34E+07	271	2.52E+04	4065	0.	
28	4.14E+07	291	3.20E+04	4370	0.	
30	2.42E+07	311	2.61E+04	4676	0.	
LWC	8.08E-03		4.49E-03		1.35E-03	TOTALS
MED D	20		105		203	94

INTERVAL START \*19115100\*  
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M\*\*3-MM)  
TYPE: BULL-ROSE

SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.58E+09	26	3.58E+04	400	1.57E+02	328.6
4	1.03E+09	47	1.88E+05	706	2.72E+00	ALT (MM)
6	6.17E+07	67	3.95E+04	1011	0.	8.713
8	6.79E+07	87	3.93E+04	1316	0.	
10	4.70E+07	108	2.66E+04	1622	0.	TEMP (C)
12	3.85E+07	128	1.84E+04	1927	0.	-35.0
14	2.73E+07	149	2.18E+04	2233	0.	
16	3.20E+07	169	1.80E+04	2538	0.	FRGSTOPPOINT
18	2.68E+07	189	4.16E+04	2843	0.	
20	1.43E+07	209	5.95E+04	3149	0.	
22	1.05E+07	230	4.78E+04	3454	0.	TAS (M/S)
24	9.74E+06	250	3.96E+04	3760	0.	121.2
26	1.13E+07	271	3.75E+04	4065	0.	
28	8.76E+06	291	1.80E+04	4370	0.	
30	9.01E+06	311	1.11E+04	4676	0.	
LWC	1.41E-03		3.56E-03		1.49E-04	TOTALS
MED D	22		107		101	91

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START 191710Z					INTERVAL START 191710Z				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE
2	6.86E+08	26	2.12E+05	1.39E+01	2	2.29E+08	26	0.	6.65E+00
4	2.47E+08	47	9.78E+05	706	4	4.64E+08	47	1.05E+06	706
6	2.16E+08	57	1.43E+05	1011	6	4.57E+08	57	1.17E+05	1011
8	1.80E+08	87	1.59E+05	1316	8	4.44E+08	87	1.19E+05	1316
10	1.44E+08	108	1.03E+05	1622	10	3.46E+08	108	5.11E+04	1622
12	1.27E+08	128	1.06E+05	1927	12	2.79E+08	128	6.55E+04	1927
14	7.59E+07	148	6.09E+04	2233	14	1.68E+08	148	3.59E+04	2233
16	1.12E+08	169	3.23E+04	2538	16	2.40E+08	169	1.27E+04	2538
18	8.72E+07	189	4.41E+04	2843	18	1.84E+08	189	2.47E+04	2843
20	4.51E+07	209	1.90E+04	3145	20	8.50E+07	209	1.40E+04	3145
22	3.59E+07	229	1.21E+04	3454	22	5.85E+07	229	9.88E+03	3454
24	3.25E+07	251	4.90E+03	3760	24	5.80E+07	250	7.30E+03	3760
26	3.02E+07	271	4.17E+03	4065	26	3.90E+07	271	2.74E+03	4065
28	2.85E+07	291	4.77E+03	4370	28	3.65E+07	291	0.	4370
30	2.13E+07	311	0.	4676	30	2.25E+07	311	0.	4676
LWC	4.87E-03	22	2.51E-03	1.20E-05	LWC	8.25E-03	19	1.71E-03	5.76E-06
MED	0	57	175	65	MED	0	64	175	61
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
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FRCSTPOINT					FRCSTPOINT				
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121.9					122.0				
TOTALS					TOTALS				
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ALT (KM)					ALT (KM)				
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ALT (KM)					ALT (KM)				
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TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
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318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
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FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
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FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
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318.7					315.9				
ALT (KM)					ALT (KM)				
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TEMP (C)					TEMP (C)				
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FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				
TAS (M/S)					TAS (M/S)				
121.9					122.0				
TOTALS					TOTALS				
2.28E-03					1.56E-03				
318.7					315.9				
ALT (KM)					ALT (KM)				
8.754					8.813				
TEMP (C)					TEMP (C)				
-35.1					-35.4				
FRCSTPOINT					FRCSTPOINT				

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 191810													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.85E+09	26	0.	400	0.	315.0	2	6.13E+07	26	3.44E+05	400	2.78E+02	315.9
4	3.11E+07	47	5.87E+04	706	0.	ALT (KM)	4	4.94E+08	47	3.69E+06	706	7.35E+00	ALT (KM)
6	9.46E+06	67	1.71E+04	1011	0.	8.815	6	7.42E+08	67	2.89E+05	1011	0.	8.815
8	8.40E+06	37	1.53E+04	1316	0.		8	6.39E+08	37	1.90E+05	1316	0.	
10	5.82E+06	109	3.46E+03	1622	0.	TEMP (C)	10	5.24E+08	109	5.16E+04	1622	0.	TEMP (C)
12	5.58E+06	128	1.16E+04	1927	0.	-35.3	12	4.17E+08	129	3.57E+04	1927	0.	-35.9
14	2.91E+06	148	2.02E+03	2233	0.		14	2.76E+08	149	2.71E+04	2233	0.	
16	6.37E+06	159	0.	2538	0.	FROSTPOINT	16	3.71E+08	169	1.79E+04	2538	0.	FROSTPOINT
18	3.40E+06	139	2.70E+03	2843	0.		18	3.19E+08	189	3.66E+04	2843	0.	
20	7.29E+05	209	0.	3149	0.		20	1.88E+08	209	3.51E+04	3149	0.	
22	1.46E+06	230	0.	3454	0.	TAS (M/S)	22	1.44E+08	230	1.82E+04	3454	0.	TAS (M/S)
24	1.94E+06	250	0.	3760	0.	124.1	24	1.10E+08	250	1.91E+04	3760	0.	125.1
26	1.21E+06	271	0.	4065	0.		26	1.03E+08	271	3.08E+04	4065	0.	
28	1.21E+06	291	0.	4370	0.		28	9.24E+07	291	1.07E+04	4370	0.	
30	2.47E+06	311	0.	4676	0.	TOTALS	30	6.78E+07	311	2.15E+04	4676	0.	TOTALS
LWC	2.66E-04	1.23E-04	59	0	1.23E-04	59	LWC	1.67E-02	4.77E-03	2.75E-04	185	3.41E-03	45
MEAN	23	59	0	0	0	59	MEAN	21	60	185	45	0	59

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 191810													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	2.57E+08	26	1.38E+05	400	8.21E+01	315.0	2	6.61E+07	26	3.46E+05	400	6.65E+02	315.0
4	4.05E+08	47	2.50E+06	706	0.	ALT (KM)	4	4.67E+08	47	3.52E+06	706	3.05E+01	ALT (KM)
6	5.32E+08	67	3.28E+05	1011	0.	8.815	6	6.73E+08	67	4.05E+05	1011	0.	8.815
8	4.40E+03	37	2.54E+05	1316	0.		8	5.51E+08	37	2.26E+05	1316	0.	
10	3.39E+08	109	7.77E+04	1622	0.	TEMP (C)	10	4.33E+08	109	6.91E+04	1622	0.	TEMP (C)
12	2.87E+08	128	5.37E+04	1927	0.	-36.0	12	3.71E+08	129	6.05E+04	1927	0.	-35.9
14	1.79E+08	148	4.53E+04	2233	0.		14	2.30E+08	149	3.52E+04	2233	0.	
16	2.47E+08	169	2.82E+04	2538	0.	FROSTPOINT	16	3.37E+08	169	2.99E+04	2538	0.	FROSTPOINT
18	2.02E+08	189	7.25E+04	2843	0.		18	2.67E+08	189	3.49E+04	2843	0.	
20	1.17E+08	209	4.39E+04	3149	0.		20	1.41E+08	209	3.51E+04	3149	0.	
22	9.51E+07	230	2.58E+04	3454	0.	TAS (M/S)	22	1.14E+08	230	4.08E+04	3454	0.	TAS (M/S)
24	6.89E+07	250	2.74E+04	3760	0.	124.3	24	9.79E+07	250	3.94E+04	3760	0.	125.0
26	7.18E+07	271	2.01E+04	4065	0.		26	9.84E+07	271	3.09E+04	4065	0.	
28	6.48E+07	291	1.07E+04	4370	0.		28	8.92E+07	291	3.53E+04	4370	0.	
30	4.26E+07	311	1.79E+03	4676	0.	TOTALS	30	6.17E+07	311	2.51E+04	4676	0.	TOTALS
LWC	1.11E-02	4.41E-03	76	7.11E-05	173	3.45E-03	LWC	1.49E-02	6.24E-03	7.20E-04	192	4.39E-03	60
MEAN	71	76	173	0	0	76	MEAN	22	53	192	60	0	76

AFML CIRRHUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START *19120140*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MH)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MH)		
2	6.11E+08	26	3.79E+05	4.00	5.60E+02	315.7	2	1.41E+09	26	3.41E+05	4.00	9.95E+00	315.4
4	2.35E+08	47	5.90E+05	706	9.44E+00	ALT (KM)	4	1.15E+09	47	9.90E+04	706	0.	ALT (KM)
6	1.79E+08	67	1.28E+05	1011	0.	8.817	6	7.76E+07	67	3.38E+04	1011	0.	8.823
8	1.38E+08	87	1.29E+05	1316	0.		8	5.09E+07	87	5.09E+04	1316	0.	
10	1.12E+08	104	7.76E+04	1622	0.	TEMP (C)	10	4.41E+07	104	9.73E+04	1622	0.	TEMP (C)
12	8.61E+07	123	6.17E+04	1927	0.	35.9	12	3.71E+07	123	1.40E+05	1927	0.	35.9
14	4.57E+07	144	7.63E+04	2233	0.		14	2.68E+07	144	9.46E+04	2233	0.	
16	7.88E+07	169	4.55E+04	2538	0.	PRECIPPOINT	16	2.76E+07	169	6.17E+04	2538	0.	PRECIPPOINT
18	6.04E+07	189	9.84E+04	2843	0.		18	2.15E+07	189	7.46E+04	2843	0.	
20	3.02E+07	209	1.04E+05	3149	0.		20	1.10E+07	209	5.90E+04	3149	0.	
22	2.54E+07	230	8.80E+04	3454	0.	TAS (M/S)	22	1.44E+07	230	1.92E+04	3454	0.	TAS (M/S)
24	2.49E+07	250	9.06E+04	3760	0.	125.0	24	6.48E+06	250	5.93E+03	3760	0.	125.1
26	2.42E+07	271	5.90E+04	4065	0.		26	1.03E+07	271	2.66E+03	4065	0.	
28	1.98E+07	291	3.37E+04	4370	0.		28	7.35E+06	291	1.53E+03	4370	0.	
30	1.48E+07	311	3.04E+04	4676	0.		30	6.54E+06	311	1.53E+03	4676	0.	
LWC	3.46E-03	7.87E-03	105	5.29E-04	181	TOTALS	LWC	1.43E-03	2.60E-03	175	8.61E-06	2.53E-03	TOTALS
MED D	27	105	181	178	81	76	MED D	22	78	175	175	76	76

AFML CIRRHUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START *19120140*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MH)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MH)		
2	3.63E+08	26	5.84E+05	4.00	1.27E+02	315.9	2	6.52E+08	26	2.39E+05	4.00	8.93E+00	315.5
4	2.66E+08	47	8.86E+05	706	1.09E+00	ALT (KM)	4	1.58E+09	47	1.70E+05	706	0.	ALT (KM)
6	2.49E+08	67	2.49E+05	1011	0.	6.822	6	1.42E+08	67	1.47E+05	1011	0.	6.822
8	1.99E+08	87	2.56E+05	1316	0.		8	1.07E+08	87	1.80E+05	1316	0.	
10	1.61E+08	104	1.51E+05	1622	0.	TEMP (C)	10	8.76E+07	104	2.33E+05	1622	0.	TEMP (C)
12	1.13E+08	123	1.82E+05	1927	0.	35.9	12	7.28E+07	123	2.60E+05	1927	0.	35.9
14	9.17E+07	143	1.19E+05	2233	0.		14	4.20E+07	144	1.79E+05	2233	0.	
16	1.01E+08	169	9.83E+04	2538	0.	PRECIPPOINT	16	5.99E+07	169	8.08E+04	2538	0.	PRECIPPOINT
18	6.77E+07	189	1.33E+05	2843	0.		18	4.39E+07	189	1.06E+05	2843	0.	
20	5.23E+07	209	1.09E+05	3149	0.		20	2.46E+07	209	6.66E+04	3149	0.	
22	4.29E+07	230	7.93E+04	3454	0.	TAS (M/S)	22	2.56E+07	230	2.97E+04	3454	0.	TAS (M/S)
24	3.57E+07	250	5.06E+04	3760	0.	125.3	24	1.39E+07	250	1.86E+04	3760	0.	125.4
26	3.78E+07	271	4.16E+04	4065	0.		26	2.08E+07	271	1.19E+04	4065	0.	
28	3.25E+07	291	2.91E+04	4370	0.		28	1.79E+07	291	1.51E+03	4370	0.	
30	3.63E+07	311	1.35E+04	4676	0.		30	1.48E+07	311	3.54E+03	4676	0.	
LWC	5.50E-03	8.16E-03	90	1.15E-04	178	TOTALS	LWC	2.86E-03	4.91E-03	175	7.73E-06	4.43E-03	TOTALS
MED D	73	90	178	178	81	73	MED D	22	79	175	175	73	73



AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START *19122100*									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	7.36E+08	25	3.43E+05	2.99E+01	319.4	2	4.09E+08	25	1.04E+05
4	1.70E+08	47	8.12E+04	0.	ALT (KM)	4	2.59E+08	47	9.40E+05
6	1.03E+08	67	7.61E+04	0.	8.823	6	2.26E+08	67	2.05E+05
8	8.88E+07	87	1.06E+05	0.		8	1.76E+08	87	1.61E+05
10	7.29E+07	107	1.37E+05	0.	TEMP (C)	10	1.36E+08	107	8.32E+04
12	5.75E+07	127	2.03E+05	0.	-36.0	12	1.19E+08	127	2.62E+04
14	3.69E+07	147	1.66E+05	0.		14	6.8E+07	147	1.62E+04
16	4.70E+07	167	8.90E+04	0.	FROSTPOINT	16	9.88E+07	167	6.66E+03
18	1.07E+07	187	1.32E+05	0.		18	6.88E+07	187	3.24E+04
20	1.83E+07	207	9.32E+04	0.	TAS (M/S)	20	3.87E+07	207	7.56E+04
22	1.70E+07	227	3.11E+04	0.	125.7	22	4.08E+07	227	8.64E+04
24	1.68E+07	247	1.78E+04	0.		24	3.21E+07	247	9.36E+04
26	1.42E+07	267	1.60E+04	0.		26	3.21E+07	267	1.01E+05
28	1.25E+07	287	9.15E+03	0.		28	2.81E+07	287	1.47E+05
30	9.12E+06	307	7.12E+03	0.	TOTALS	30	1.75E+07	307	7.59E+04
LWC	2.13E-03		5.13E-03	2.59E-05	4.28E-03	LWC	4.30E-03		1.06E-02
MED	0		83	175	79	MED	0		119
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START *19122100*									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: BULL-ROSE									
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	2.80E+08	25	3.10E+05	6.55E+02	319.7	2	1.12E+09	25	0.
4	3.55E+08	47	1.92E+06	6.30E+00	ALT (KM)	4	1.62E+08	47	6.64E+05
6	3.81E+08	67	2.59E+05	5.51E-01	8.817	6	1.46E+08	67	7.70E+04
8	3.20E+08	87	1.89E+05	0.		8	1.46E+08	87	4.35E+04
10	2.58E+08	107	9.30E+04	0.	TEMP (C)	10	1.09E+08	107	2.06E+04
12	2.11E+08	127	9.23E+04	0.	-36.1	12	7.78E+07	127	2.62E+04
14	1.29E+08	147	3.41E+04	0.		14	4.93E+07	147	9.10E+03
16	1.93E+08	167	2.40E+04	0.	FROSTPOINT	16	7.17E+07	167	5.85E+03
18	1.43E+08	187	8.16E+04	0.		18	4.81E+07	187	5.41E+03
20	8.72E+07	207	1.23E+04	0.	TAS (M/S)	20	2.79E+07	207	1.24E+04
22	6.86E+07	227	1.50E+05	0.	125.1	22	2.50E+07	227	1.30E+04
24	5.89E+07	247	1.17E+05	0.		24	2.08E+07	247	3.13E+04
26	5.26E+07	267	1.07E+05	0.		26	2.04E+07	267	5.81E+04
28	4.49E+07	287	9.20E+04	0.		28	1.72E+07	287	5.42E+04
30	3.77E+07	307	4.29E+04	0.	TOTALS	30	1.72E+07	307	1.80E+04
LWC	8.42E-03		1.18E-02	6.04E-04	5.66E-03	LWC	3.66E-03		4.01E-02
MED	0		109	179	91	MED	0		120



AFML CIRRUS STUDY BY AFGL												
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING												
INTERVAL START *1912410*												
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: BULL-ROSE												
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MR)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	5.79E+08	26	1.04E+05	400	2.97E+02	315.5	2	1.47E+08	26	4.18E+05	400	9.30E+01
4	3.12E+08	47	2.23E+05	706	3.70E+00	ALT (KM)	4	4.02E+08	47	2.17E+06	706	1.06E+00
6	3.70E+08	57	3.39E+05	1011	0.	8.823	6	5.26E+08	57	2.45E+05	1011	0.
8	3.78E+08	37	1.87E+05	1316	0.		8	4.71E+08	37	2.17E+05	1316	0.
10	2.46E+08	134	7.81E+04	1522	0.	TEMP (C)	10	3.59E+08	134	9.92E+04	1522	0.
12	2.13E+08	123	4.12E+04	1927	0.	-56.0	12	7.03E+08	123	1.04E+05	1927	0.
14	1.13E+08	148	2.94E+04	2233	0.		14	1.64E+08	148	7.71E+04	2233	0.
16	1.87E+08	149	1.84E+04	2538	0.	PRECIPPOINT	16	2.75E+08	149	4.18E+04	2538	0.
18	1.47E+08	159	4.87E+04	2943	0.		18	1.58E+08	159	5.50E+04	2943	0.
20	7.78E+07	209	7.08E+04	3149	0.		20	1.18E+08	209	4.02E+04	3149	0.
22	6.29E+07	230	5.84E+04	3454	0.	TAS (M/S)	22	9.50E+07	230	3.24E+04	3454	0.
24	4.80E+07	250	5.05E+04	3760	0.	123.9	24	6.72E+07	250	1.44E+04	3760	0.
26	5.73E+07	271	4.87E+04	4065	0.		26	6.76E+07	271	1.48E+04	4065	0.
28	5.29E+07	291	2.17E+04	4370	0.		28	6.57E+07	291	1.23E+04	4370	0.
30	3.49E+07	311	1.26E+04	4676	0.	TOTALS	30	4.41E+07	311	1.26E+04	4676	0.
LWC	6.25E-03	5.87E-03	2.75E-04	150			LWC	1.17E-02	4.62E-03	8.55E-05	3.63E-03	179
MED D	22	97					MED D	21	77			66

AFML CIRRUS STUDY BY AFGL												
FLIGHT E7A-03 ON 26 FEB 78 30 SECOND AVERAGING												
INTERVAL START *1912410*												
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)												
TYPE: BULL-ROSE												
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MR)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE
2	1.54E+08	26	1.74E+05	400	8.59E+01	315.5	2	5.30E+07	26	1.79E+05	400	8.83E+01
4	3.78E+08	47	2.77E+05	706	9.31E+01	ALT (KM)	4	5.07E+08	47	2.14E+06	706	1.54E+00
6	4.20E+08	57	4.61E+05	1011	0.	8.823	6	8.59E+08	57	2.04E+05	1011	0.
8	3.98E+08	37	2.02E+05	1316	0.		8	7.94E+08	37	1.64E+05	1316	0.
10	2.68E+08	134	1.24E+05	1522	0.	TEMP (C)	10	6.16E+08	134	7.31E+04	1522	0.
12	2.48E+08	123	1.02E+05	1927	0.	-55.9	12	5.30E+08	123	7.09E+04	1927	0.
14	1.70E+08	143	8.56E+04	2233	0.		14	3.28E+08	143	4.67E+04	2233	0.
16	2.08E+08	169	4.86E+04	2938	0.	PRECIPPOINT	16	4.86E+08	169	2.76E+04	2938	0.
18	1.51E+08	189	7.51E+04	2843	0.		18	3.54E+08	189	4.97E+04	2843	0.
20	9.20E+07	209	7.31E+04	3149	0.	TAS (M/S)	20	1.00E+08	209	3.64E+04	3149	0.
22	8.27E+07	230	5.00E+04	3454	0.	123.9	22	1.45E+08	230	1.84E+04	3454	0.
24	5.92E+07	250	4.23E+04	3760	0.		24	1.09E+08	250	2.09E+04	3760	0.
26	6.08E+07	271	2.72E+04	4065	0.		26	8.53E+07	271	1.08E+04	4065	0.
28	5.79E+07	291	1.09E+04	4370	0.		28	9.37E+07	291	1.24E+04	4370	0.
30	4.52E+07	311	5.44E+03	4676	0.	TOTALS	30	5.47E+07	311	5.44E+03	4676	0.
LWC	9.64E-03	6.12E-03	7.67E-05	177			LWC	1.75E-02	3.70E-03	8.33E-05	2.85E-03	102
MED D	22	81					MED D	20	77			66

AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START *1912510*					INTERVAL START *1912510*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	4.09E+07	26	1.05E+05	4.00	315.9	2	7.31E+07	26	4.24E+05
4	5.52E+08	47	1.00E+06	706	0.	4	4.99E+08	47	1.44E+06
6	1.57E+09	67	8.51E+04	1011	0.	6	1.20E+09	67	2.44E+05
8	1.76E+09	87	3.08E+04	1316	0.	8	1.20E+09	87	2.67E+05
10	1.34E+09	108	2.44E+04	1622	0.	10	9.00E+08	108	1.68E+05
12	1.17E+09	128	2.58E+04	1927	0.	12	7.19E+08	128	1.67E+05
14	6.17E+08	148	8.13E+03	2233	0.	14	4.16E+08	148	9.46E+04
16	9.14E+08	169	8.40E+03	2538	0.	16	6.10E+08	169	5.85E+04
18	6.22E+08	189	4.53E+03	2843	0.	18	4.26E+08	189	7.69E+04
20	2.87E+08	209	6.91E+03	3149	0.	20	1.76E+08	209	3.40E+04
22	1.64E+08	230	1.09E+03	3454	0.	22	1.13E+08	230	3.74E+04
24	9.31E+07	250	0.	3760	0.	24	7.19E+07	250	1.38E+04
26	7.45E+07	271	1.36E+03	4065	0.	26	6.55E+07	271	4.12E+03
28	5.08E+07	291	0.	4370	0.	28	5.29E+07	291	6.28E+03
30	2.56E+07	311	0.	4676	0.	30	3.76E+07	311	5.51E+03
TOTALS					TOTALS				
LWC	2.24E-02	8.78E-04	2.19E-06	8.56E-04	LWC	1.64E-02	4.42E-03	7.56E-05	3.87E-03
MEQ	0	38	175	37	MEQ	0	72	175	67
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START *1912510*					INTERVAL START *1912510*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	7.04E+07	26	3.51E+04	4.00	316.1	2	1.72E+08	26	3.53E+04
4	5.95E+08	47	1.50E+06	706	0.	4	4.67E+08	47	1.35E+06
6	1.53E+09	67	1.43E+05	1011	0.	6	5.14E+08	67	1.69E+05
8	1.47E+09	87	1.71E+05	1316	0.	8	5.08E+08	87	1.18E+05
10	1.21E+09	108	6.15E+04	1622	0.	10	3.66E+08	108	8.77E+04
12	9.71E+08	128	4.95E+04	1927	0.	12	3.22E+08	128	1.24E+05
14	5.68E+08	148	3.08E+04	2233	0.	14	1.76E+08	148	8.91E+04
16	8.50E+08	169	1.39E+04	2538	0.	16	2.76E+08	169	4.47E+04
18	5.22E+08	189	2.10E+04	2843	0.	18	2.20E+08	189	5.01E+04
20	2.66E+08	209	8.50E+03	3149	0.	20	1.80E+08	209	3.77E+04
22	1.41E+08	230	1.10E+04	3454	0.	22	8.29E+07	230	2.07E+04
24	8.79E+07	250	1.22E+03	3760	0.	24	5.95E+07	250	6.05E+03
26	8.32E+07	271	1.36E+03	4065	0.	26	5.23E+07	271	2.75E+03
28	5.77E+07	291	1.50E+03	4370	0.	28	4.57E+07	291	4.64E+03
30	3.45E+07	311	0.	4676	0.	30	2.53E+07	311	1.80E+03
TOTALS					TOTALS				
LWC	2.12E-02	1.75E-03	2.66E-06	1.68E-03	LWC	9.80E-03	3.11E-03	4.38E-06	2.83E-03
MEQ	0	34	175	92	MEQ	0	71	175	69

AFML CIRRUS STUDY BY AFGL									
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL				
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					FLIGHT E76-03 ON 26 FEB 78 30 SECOND AVERAGING				
INTERVAL START *19128110*					INTERVAL START *19128110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTE- PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTE- PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.42E+09	26	6.02E+04	4.00	2	2.35E+09	26	6.92E+04	4.00
4	2.24E+08	47	5.92E+05	706	4	6.54E+07	47	3.69E+04	706
6	2.46E+08	67	6.28E+04	1011	6	3.15E+07	67	2.57E+04	1011
8	2.69E+08	87	1.00E+04	1316	8	2.69E+07	87	3.59E+04	1316
10	1.52E+08	109	1.87E+04	1622	10	1.50E+07	109	3.20E+04	1622
12	1.80E+08	129	5.01E+03	1927	12	1.53E+07	129	3.60E+04	1927
14	9.53E+07	148	7.95E+03	2233	14	9.53E+06	148	2.43E+04	2233
16	1.42E+08	169	2.45E+03	2538	16	1.31E+07	169	1.00E+04	2538
18	1.09E+08	189	8.79E+02	2843	18	8.79E+06	189	2.66E+04	2843
20	5.79E+07	209	2.87E+03	3149	20	7.27E+06	209	2.62E+04	3149
22	3.71E+07	230	3.19E+03	3454	22	4.54E+05	230	9.61E+03	3454
24	2.75E+07	251	2.75E+03	3760	24	3.63E+05	251	8.32E+03	3760
26	2.54E+07	271	7.95E+03	4065	26	4.13E+05	271	5.35E+03	4065
28	2.25E+07	291	4.52E+03	4370	28	3.60E+05	291	4.60E+03	4370
30	1.15E+07	311	3.51E+03	4676	30	3.16E+05	311	1.78E+03	4676
TOTALS					TOTALS				
LMC	4.09E-03	19	7.96E-04	4.29E-05	LMC	6.46E-04	1.29E-03	9.08E-05	5.35E-04
MED	19	70	179	42	MED	22	99	175	82
INTERVAL START *19128110*					INTERVAL START *19128110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-M)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTE- PROBE	SIZE (MU)	CLOUD PROBE	P (MB)	SIZE (MU)	SCATTE- PROBE	SIZE (MU)	CLOUD PROBE	P (MB)
2	1.19E+09	26	1.02E+05	4.00	2	4.75E+08	26	7.04E+04	4.00
4	1.40E+08	47	6.26E+04	706	4	2.52E+08	47	9.41E+05	706
6	8.80E+07	67	0.26E+04	1011	6	2.04E+08	67	1.36E+05	1011
8	6.38E+07	87	9.99E+03	1316	8	1.32E+08	87	1.12E+05	1316
10	5.42E+07	109	1.67E+04	1622	10	1.35E+08	109	8.48E+04	1622
12	3.78E+07	129	5.79E+04	1927	12	1.80E+08	129	7.00E+04	1927
14	2.40E+07	148	5.94E+04	2233	14	6.78E+07	148	4.44E+04	2233
16	3.26E+07	169	5.72E+04	2538	16	1.03E+08	169	2.56E+04	2538
18	2.26E+07	189	1.30E+05	2843	18	4.46E+07	189	1.84E+04	2843
20	1.36E+07	209	9.42E+04	3149	20	4.54E+07	209	2.64E+04	3149
22	1.07E+07	230	8.35E+04	3454	22	3.67E+07	230	1.43E+04	3454
24	9.51E+06	251	6.34E+04	3760	24	3.18E+07	251	8.16E+03	3760
26	9.04E+06	271	5.81E+04	4065	26	3.77E+07	271	2.72E+03	4065
28	9.04E+06	291	5.02E+04	4370	28	2.41E+07	291	6.34E+03	4370
30	7.66E+06	311	1.23E+04	4676	30	2.41E+07	311	3.70E+03	4676
TOTALS					TOTALS				
LMC	1.51E-03	22	6.26E-02	2.15E-04	LMC	4.89E-03	2.24E-03	1.39E-05	1.84E-03
MED	22	103	177	89	MED	22	71	175	64

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START *191311+00*						INTERVAL START *191311+00*							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE						TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	9.22E+08	26	3.22E+05	400	5.54E+01	331.7	2	1.04E+09	26	1.78E+05	400	1.02E+02	339.7
4	1.46E+08	47	2.25E+05	706	5.49E-01	8.483	4	1.53E+08	47	5.65E+05	706	6.65E+08	ALT (KM)
6	8.50E+07	57	7.06E+04	1011	0.	8.483	6	9.69E+07	57	1.01E+05	1011	5.68E-01	8.319
8	5.68E+07	37	5.50E+04	1316	0.		8	6.76E+07	37	6.53E+04	1316	0.	
10	4.86E+07	198	8.04E+04	1622	0.	TEMP (C)	10	6.97E+07	198	2.49E+04	1622	0.	TEMP (C)
12	4.43E+07	128	8.74E+04	1927	0.	-33.2	12	5.35E+07	128	5.53E+04	1927	0.	-32.4
14	2.63E+07	148	7.30E+04	2233	0.		14	2.81E+07	148	5.39E+04	2233	0.	PROSTPOINT
16	4.38E+07	158	3.62E+04	2538	0.		16	4.56E+07	158	4.78E+04	2538	0.	
18	3.06E+07	188	5.49E+04	2843	0.		18	3.39E+07	188	7.85E+04	2843	0.	
20	1.55E+07	208	4.77E+04	3149	0.		20	2.02E+07	208	5.82E+04	3149	0.	
22	1.70E+07	238	3.57E+04	3454	0.	TAS (M/S)	22	1.64E+07	238	3.55E+04	3454	0.	TAS (M/S)
24	9.02E+06	258	2.11E+04	3760	0.	120.4	24	1.45E+07	258	1.89E+04	3760	0.	121.1
26	1.05E+07	271	1.68E+04	4065	0.		26	1.47E+07	271	1.11E+04	4065	0.	
28	1.50E+07	291	1.12E+04	4370	0.		28	1.37E+07	291	9.53E+03	4370	0.	
30	7.76E+06	311	5.57E+03	4676	0.		30	9.47E+06	311	9.23E+03	4676	0.	
LWC	1.87E-03		8.70E-03	90		TOTALS	LWC	2.15E-03		3.36E-03		1.37E-04	TOTALS
MED D	22				5.05E-05	179	MED D	22		49		212	2.58E-03
						51							84

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING							
INTERVAL START *191311+00*						INTERVAL START *191311+00*							
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)							
TYPE: BULL-ROSE						TYPE: BULL-ROSE							
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.37E+09	26	7.15E+04	400	4.73E+02	325.4	2	9.63E+08	26	2.51E+05	400	5.76E+01	343.2
4	9.68E+07	47	6.58E+04	706	3.27E+01	ALT (KM)	4	1.40E+08	47	2.93E+05	706	5.40E-01	ALT (KM)
6	5.05E+07	57	4.42E+03	1011	1.14E+01	8.406	6	1.00E+08	57	9.76E+04	1011	0.	6.269
8	3.98E+07	37	1.06E+04	1316	0.		8	8.44E+07	37	1.11E+05	1316	0.	
10	3.80E+07	138	2.69E+04	1622	0.	TEMP (C)	10	6.46E+07	138	0.98E+04	1622	0.	TEMP (C)
12	2.79E+07	128	3.59E+04	1927	0.	-32.9	12	5.13E+07	128	8.22E+04	1927	0.	-32.9
14	2.06E+07	148	5.40E+04	2233	0.		14	3.78E+07	148	9.70E+04	2233	0.	
16	2.44E+07	158	3.62E+04	2538	0.	PROSTPOINT	16	4.25E+07	158	5.34E+04	2538	0.	PROSTPOINT
18	1.91E+07	188	5.40E+04	2843	0.		18	3.22E+07	188	9.56E+04	2843	0.	
20	1.11E+07	208	6.30E+04	3149	0.		20	1.76E+07	208	7.19E+04	3149	0.	
22	8.79E+06	238	2.80E+04	3454	0.	TAS (M/S)	22	1.61E+07	238	3.68E+04	3454	0.	TAS (M/S)
24	7.53E+06	258	3.60E+04	3760	0.	120.1	24	1.46E+07	258	2.97E+04	3760	0.	120.4
26	8.54E+06	271	1.54E+04	4065	0.		26	1.56E+07	271	1.25E+04	4065	0.	
28	6.29E+06	291	2.71E+04	4370	0.		28	1.53E+07	291	7.94E+03	4370	0.	
30	5.03E+06	311	1.49E+04	4676	0.		30	1.13E+07	311	5.71E+03	4676	0.	
LWC	1.17E-03		3.54E-03	109		TOTALS	LWC	2.22E-03		4.10E-03		4.81E-05	TOTALS
MED D	22				5.05E-05	203	MED D	22		86		179	2.22E-03
						91							81



AFWL CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START *19132110*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE1 BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	7.35E+08	26	1.08E+05	400	2.26E+02	346.5	2	3.11E+09	26	0.	400	3.62E+02	353.9
4	1.75E+08	47	3.29E+05	706	2.72E+00	ALT (KM)	4	3.41E+07	47	0.	706	5.44E+01	ALT (KM)
6	1.20E+08	67	6.63E+04	1011	0.	8.183	6	8.70E+06	67	0.	1011	1.70E+10	8.037
8	8.74E+07	87	1.39E+05	1316	0.		8	0.70E+06	87	0.	1316	0.	
10	6.56E+07	104	5.72E+04	1622	0.	TEMP (C)	10	5.72E+06	108	7.55E+03	1622	0.	TEMP (C)
12	5.46E+07	124	9.25E+04	1927	0.	-31.7	12	3.73E+06	126	0.	1927	0.	-30.6
14	3.68E+07	148	5.15E+04	2233	0.		14	3.23E+06	144	0.	2233	0.	
16	4.89E+07	169	4.55E+04	2538	0.	FROSTPOINT	16	3.40E+06	159	0.	2538	0.	FROSTPOINT
18	3.81E+07	189	8.25E+04	2843	0.		18	1.99E+06	189	9.22E+02	2843	0.	
20	2.13E+07	209	7.26E+04	3149	0.		20	2.74E+06	209	0.	3149	0.	
22	1.57E+07	230	5.01E+04	3454	0.	TAS (M/S)	22	1.24E+06	230	1.11E+03	3454	0.	TAS (M/S)
24	1.59E+07	261	4.45E+04	3760	0.	120.6	24	4.87E+05	260	0.	3760	0.	121.4
26	1.78E+07	271	2.78E+04	4065	0.		26	9.56E+05	271	4.14E+02	4065	0.	
28	1.79E+07	291	3.18E+04	4370	0.		28	7.46E+05	291	0.	4370	0.	
30	1.08E+07	311	1.11E+04	4676	0.	TOTALS	30	2.49E+05	311	0.	4676	0.	TOTALS
LWC	2.44E-03		5.04E-03		2.09E-04	3.12E-03	LWC	1.71E-04		1.03E-04		5.92E-04	6.21E-04
MED D	23		98		179	85	MED D	19		116		235	229

AFWL CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START *19132110*													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE1 BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.02E+09	26	0.	400	2.84E+03	349.7	2	3.50E+09	26	0.	400	1.57E+01	357.1
4	1.77E+08	47	9.36E+04	706	1.04E+02	ALT (KM)	4	3.41E+07	47	0.	706	0.	ALT (KM)
6	8.50E+07	67	2.64E+04	1011	4.55E+00	8.120	6	0.	67	0.	1011	0.	7.976
8	5.68E+07	87	4.23E+03	1316	0.		8	5.06E+05	87	0.	1316	0.	
10	4.94E+07	104	5.74E+03	1622	0.	TEMP (C)	10	0.	104	0.	1622	0.	TEMP (C)
12	3.59E+07	124	8.99E+03	1927	0.	-31.3	12	0.	124	0.	1927	0.	-30.3
14	2.04E+07	148	4.15E+03	2233	0.		14	0.	148	0.	2233	0.	
16	3.29E+07	169	2.56E+03	2538	0.	FROSTPOINT	16	0.	169	0.	2538	0.	FROSTPOINT
18	2.07E+07	189	1.76E+04	2843	0.		18	0.	189	0.	2843	0.	
20	1.47E+07	209	3.02E+04	3149	0.		20	0.	209	0.	3149	0.	
22	8.47E+06	230	3.44E+04	3454	0.	TAS (M/S)	22	0.	230	0.	3454	0.	TAS (M/S)
24	6.35E+06	261	3.70E+04	3760	0.	121.1	24	0.	260	0.	3760	0.	119.6
26	7.73E+06	271	5.96E+04	4065	0.		26	0.	271	0.	4065	0.	
28	8.08E+06	291	5.33E+04	4370	0.		28	0.	291	0.	4370	0.	
30	6.48E+06	311	4.60E+04	4676	0.	TOTALS	30	0.	311	0.	4676	0.	TOTALS
LWC	1.39E-03		5.16E-03		3.29E-03	4.16E-03	LWC	3.17E-05		0.		1.36E-06	1.36E-06
MED D	21		123		198	174	MED D	0		0		175	175

AFML CIRRUS STUDY BY AFGL													
FLIGHT 878-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 1913:40													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	3.19E+09	26	0.	400	2.15E+02	360.0	2	2.06E+09	26	0.	400	1.56E+03	360.2
4	3.84E+07	47	1.89E+04	706	1.17E+01	ALT (KM)	4	7.14E+07	47	5.69E+04	706	1.96E+02	ALT (KM)
6	8.88E+06	67	4.44E+03	1011	1.73E+01	7.909	6	3.59E+07	57	1.33E+04	1011	1.21E+01	7.764
8	5.30E+06	47	0.	1316	0.	TEMP (C)	8	3.66E+07	37	5.30E+03	1316	0.	TEMP (C)
10	5.80E+06	104	0.	1622	0.	-29.8	10	3.23E+07	104	5.40E+03	1622	0.	-26.7
12	3.03E+06	124	2.57E+03	1927	0.		12	1.62E+07	124	1.07E+04	1927	0.	
14	2.02E+06	149	0.	2233	0.		14	1.56E+07	149	4.20E+03	2233	0.	
16	2.52E+06	169	8.66E+02	2538	0.	PRECIPPOINT	16	1.77E+07	169	6.97E+03	2538	0.	PRECIPPOINT
18	1.77E+06	189	6.54E+03	2843	0.		18	1.49E+07	189	7.48E+03	2843	0.	
20	7.66E+05	209	4.07E+03	3149	0.		20	8.08E+06	209	6.18E+03	3149	0.	
22	1.01E+06	230	1.01E+04	3454	0.	TAS (M/S)	22	5.55E+06	230	1.12E+04	3454	0.	TAS (M/S)
24	2.52E+05	250	1.12E+04	3760	0.	119.5	24	3.28E+06	250	6.24E+03	3760	0.	119.7
26	2.52E+05	271	1.40E+03	4065	0.		26	5.61E+06	271	7.02E+03	4065	0.	
28	5.05E+06	291	3.20E+03	4370	0.		28	5.01E+06	291	9.61E+03	4370	0.	
30	5.05E+06	311	1.87E+03	4676	0.	TOTALS	30	1.51E+06	311	2.24E+04	4676	0.	TOTALS
LWC	1.36E-04	18	5.15E-04	108	4.07E-04	6.17E-04	LWC	7.83E-04	21	1.39E-03	124	2.45E-03	229
MEQ D	15				254	179	MEQ D	21					212

AFML CIRRUS STUDY BY AFGL													
FLIGHT 878-03 ON 26 FEB 78 30 SECOND AVERAGING													
INTERVAL START 1913:40													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE: BULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)
2	1.97E+09	26	0.	400	1.25E+01	360.1	2	2.54E+09	26	0.	400	1.35E+03	371.5
4	9.88E+07	47	9.70E+04	706	1.50E+02	ALT (KM)	4	7.42E+07	47	9.46E+03	706	1.04E+02	ALT (KM)
6	5.68E+07	67	3.11E+04	1011	4.61E+00	7.840	6	3.55E+07	57	4.46E+03	1011	5.20E+00	7.701
8	3.61E+07	47	2.65E+04	1316	0.	TEMP (C)	8	2.09E+07	37	1.86E+04	1316	0.	TEMP (C)
10	3.03E+07	104	2.52E+04	1622	0.	-29.2	10	2.28E+07	104	1.80E+04	1622	0.	-26.5
12	2.17E+07	124	2.27E+04	1927	0.		12	1.62E+07	124	5.35E+03	1927	0.	
14	1.44E+07	149	1.47E+04	2233	0.		14	1.04E+07	149	4.21E+03	2233	0.	
16	2.02E+07	169	7.08E+03	2538	0.	PRECIPPOINT	16	1.49E+07	169	0.	2538	0.	PRECIPPOINT
18	1.52E+07	189	1.59E+04	2843	0.		18	9.11E+06	189	0.	2843	0.	
20	7.87E+06	209	1.59E+04	3149	0.		20	5.06E+06	209	3.07E+03	3149	0.	
22	4.59E+06	230	1.79E+04	3454	0.	TAS (M/S)	22	3.86E+06	230	4.50E+03	3454	0.	TAS (M/S)
24	5.61E+06	250	4.99E+03	3760	0.	119.6	24	3.86E+06	250	6.25E+03	3760	0.	119.3
26	5.61E+06	271	1.40E+04	4065	0.		26	3.03E+06	271	1.97E+04	4065	0.	
28	5.05E+06	291	9.62E+03	4370	0.		28	3.94E+06	291	1.45E+04	4370	0.	
30	5.05E+06	311	1.12E+04	4676	0.	TOTALS	30	2.79E+06	311	2.06E+04	4676	0.	TOTALS
LWC	9.05E-04	27	1.56E-03	112	1.87E-03	2.60E-03	LWC	5.93E-04	21	1.45E-03	124	1.75E-03	229
MEQ D	27				224	179	MEQ D	21					201

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START *193740*						INTERVAL START *193740*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.69E+09	25	0.	6.79E+02	374.4	2	1.47E+09	25	1.08E+05	400	5.59E+01
4	4.73E+07	47	0.	8.68E+01	ALT (KM)	4	8.30E+07	47	9.49E+04	706	5.48E+01
6	1.54E+07	57	4.47E+03	1011	7.646	6	6.43E+07	57	2.66E+04	1011	0.
8	1.57E+07	97	2.65E+03	1316	0.	8	4.41E+07	97	5.84E+04	1316	0.
10	9.62E+06	108	3.62E+03	1622	0.	10	3.48E+07	108	7.19E+04	1622	0.
12	7.65E+06	123	0.	1927	0.	12	2.95E+07	123	7.99E+04	1927	0.
14	3.54E+06	143	0.	2233	0.	14	1.59E+07	143	7.66E+04	2233	0.
16	3.32E+06	163	0.	2538	0.	16	2.22E+07	163	3.29E+04	2538	0.
18	3.04E+06	183	9.32E+02	2843	0.	18	1.79E+07	183	6.08E+04	2843	0.
20	2.03E+06	203	1.07E+03	3149	0.	20	1.03E+07	203	4.13E+04	3149	0.
22	2.79E+06	223	1.13E+03	3454	0.	22	9.08E+06	223	1.41E+04	3454	0.
24	2.02E+06	243	0.	3760	0.	24	6.81E+06	243	1.12E+04	3760	0.
26	1.77E+06	263	2.81E+03	4065	0.	26	7.82E+06	263	1.54E+04	4065	0.
28	1.27E+06	283	6.44E+03	4370	0.	28	7.82E+06	283	1.12E+04	4370	0.
30	1.27E+06	303	7.53E+03	4676	0.	30	4.29E+06	303	1.68E+04	4676	0.
LWC	2.89E-04	4.79E-04	1.07E-03	1.11E-03	225	LWC	1.13E-03	3.00E-03	5.10E-05	2.01E-03	81
MED	21	131	230	198		MED	22	91	179	103	
TOTALS						TOTALS					
Interval Start *193740*											
AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START *193740*						INTERVAL START *193740*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.15E+09	25	7.15E+04	3.75E+02	378.2	2	1.07E+09	25	1.10E+05	400	4.95E+01
4	6.31E+07	47	1.51E+05	5.19E+01	ALT (KM)	4	1.22E+08	47	2.89E+04	706	1.11E+01
6	3.19E+07	57	4.42E+04	3.44E+01	7.576	6	7.57E+07	57	5.86E+04	1011	0.
8	2.34E+07	97	5.53E+04	1316	0.	8	6.20E+07	97	5.89E+04	1316	0.
10	1.61E+07	108	2.51E+04	1622	0.	10	4.66E+07	108	9.67E+04	1622	0.
12	1.66E+07	123	1.19E+04	1927	0.	12	3.55E+07	123	1.64E+05	1927	0.
14	8.96E+06	143	4.18E+03	2233	0.	14	2.50E+07	143	1.37E+05	2233	0.
16	1.31E+07	163	2.58E+03	2538	0.	16	3.56E+07	163	7.84E+04	2538	0.
18	1.66E+07	183	2.79E+03	2843	0.	18	2.61E+07	183	1.26E+05	2843	0.
20	5.02E+06	203	4.06E+03	3149	0.	20	1.59E+07	203	7.46E+04	3149	0.
22	5.78E+06	223	2.23E+03	3454	0.	22	1.28E+07	223	3.88E+04	3454	0.
24	5.27E+06	243	1.24E+03	3760	0.	24	1.20E+07	243	3.98E+04	3760	0.
26	5.02E+06	263	0.	4065	0.	26	1.20E+07	263	9.99E+03	4065	0.
28	4.27E+06	283	0.	4370	0.	28	1.15E+07	283	3.27E+03	4370	0.
30	3.77E+06	303	3.72E+03	4676	0.	30	7.44E+06	303	1.68E+03	4676	0.
LWC	7.40E-04	4.93E-04	6.18E-04	9.92E-04	198	LWC	1.72E-03	4.14E-03	4.81E-05	3.62E-03	81
MED	23	84	236	198		MED	73	84	103	103	
TOTALS						TOTALS					

AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING													
INTERVAL START 191339.100													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE1 GULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	8.45E+08	26	2.59E+05	400	3.13E+02	389.9	2	2.37E+09	26	3.74E+04	400	2.62E+02	486.7
4	1.50E+08	47	8.75E+04	706	5.11E+00	ALT (KM)	4	9.23E+07	47	9.08E+03	706	2.79E+01	ALT (KM)
6	9.65E+07	67	1.38E+04	1011	0.	7.362	6	2.77E+07	67	9.26E+03	1011	0.	7.171
8	8.45E+07	87	1.09E+04	1316	0.		8	2.49E+07	87	2.79E+03	1316	0.	
10	6.3E+07	108	1.67E+04	1622	0.	TEMP (C)	10	1.91E+07	108	3.74E+03	1622	0.	TEMP (C)
12	4.76E+07	128	1.92E+04	1927	0.	-27.7	12	1.42E+07	128	2.70E+03	1927	0.	-26.7
14	3.62E+07	148	8.21E+03	2233	0.		14	1.05E+07	148	4.37E+03	2233	0.	
16	3.72E+07	169	7.13E+03	2538	0.	FROSTPOINT	16	8.90E+06	169	1.35E+04	2538	0.	FROSTPOINT
18	3.22E+07	189	1.56E+05	2843	0.		18	6.53E+06	189	3.11E+04	2843	0.	
20	1.74E+07	209	2.01E+05	3149	0.		20	5.78E+06	209	4.52E+04	3149	0.	
22	1.82E+07	230	1.20E+05	3454	0.	TAS (M/S)	22	3.40E+06	230	3.96E+04	3454	0.	TAS (M/S)
24	1.12E+07	250	6.80E+04	3760	0.	116.2	24	4.97E+06	250	2.49E+04	3760	0.	116.8
26	1.20E+07	271	6.65E+04	4065	0.		26	2.36E+06	271	3.06E+04	4065	0.	
28	1.25E+07	291	2.37E+04	4370	0.		28	4.19E+06	291	9.97E+03	4370	0.	
30	9.11E+06	311	2.70E+04	4676	0.		30	3.67E+06	311	9.73E+03	4676	0.	
LWC	1.95E-03		8.25E-03		2.95E-04	TOTALS	LWC	6.02E-04		2.52E-03		3.56E-04	TOTALS
MED 0	22		100		141	91	MED 0	23		134		213	97
AFML CIRRUS STUDY BY AFGL													
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING													
INTERVAL START 191339.100													
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)													
TYPE1 GULL-ROSE													
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MM)
2	9.62E+08	26	7.49E+04	400	5.66E+02	394.5	2	2.78E+09	26	0.	400	6.71E+02	499.0
4	1.26E+08	47	1.08E+05	706	1.54E+01	ALT (KM)	4	3.51E+07	47	0.	706	1.79E+02	ALT (KM)
6	8.79E+07	67	9.24E+03	1011	1.20E+00	7.279	6	1.03E+07	67	4.55E+03	1011	2.19E+01	7.025
8	7.22E+07	87	1.30E+05	1316	0.	TEMP (C)	8	7.78E+06	87	2.70E+03	1316	1.06E+04	TEMP (C)
10	5.48E+07	108	5.62E+03	1622	0.	-27.2	10	9.28E+06	108	0.	1622	6.54E-01	TEMP (C)
12	4.20E+07	128	2.78E+04	1927	0.	FROSTPOINT	12	3.09E+06	128	0.	1927	0.	TEMP (C)
14	3.05E+07	148	4.04E+04	2233	0.		14	4.3E+06	148	3.21E+03	2233	0.	FROSTPOINT
16	3.99E+07	169	6.04E+04	2538	0.		16	3.62E+06	169	9.56E+02	2538	0.	FROSTPOINT
18	3.07E+07	189	1.46E+05	2843	0.		18	2.84E+06	189	9.56E+02	2843	6.41E-01	
20	2.10E+07	209	1.17E+05	3149	0.	TAS (M/S)	20	1.55E+06	209	0.	3149	0.	TAS (M/S)
22	1.02E+07	230	7.23E+04	3454	0.	119.0	22	1.55E+06	230	0.	3454	0.	117.2
24	9.72E+06	250	7.26E+04	3760	0.		24	5.18E+05	250	0.	3760	0.	
26	1.10E+07	271	4.52E+04	4065	0.		26	1.03E+06	271	0.	4065	0.	
28	1.21E+07	291	3.17E+04	4370	0.		28	1.03E+06	291	0.	4370	0.	
30	7.61E+06	311	3.89E+04	4676	0.		30	5.15E+05	311	0.	4676	0.	
LWC	1.79E-03		6.92E-03		5.79E-04	TOTALS	LWC	1.68E-04		2.63E-05		2.09E-03	TOTALS
MED 0	22		106		107	91	MED 0	19		71		319	313



AFML CIRRUS STUDY BY AFGL									
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL				
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START *191410*					INTERVAL START *191410*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER (MU)	CLOUD (MU)	PRECIP (MU)	P (MB)	SIZE (MU)	SCATTER (MU)	CLOUD (MU)	PRECIP (MU)	P (MB)
2	1.87E+09	26	0.	417.0	2	2.86E+09	26	3.79E+04	4.00
4	7.53E+07	47	2.97E+02	ALT (KM)	4	3.69E+07	47	9.99E+03	706
6	4.87E+07	57	9.72E+01	6.867	6	1.04E+07	57	1.41E+04	1011
8	3.52E+07	97	2.27E+01		8	1.01E+07	97	1.12E+04	1316
10	2.78E+07	108	3.74E+03	TEMP (C)	10	5.33E+06	108	7.60E+03	1622
12	2.18E+07	128	4.16E+03	-24.4	12	8.79E+06	128	4.23E+03	1927
14	1.34E+07	148	2.19E+03	7.41E-01	14	5.33E+06	148	6.65E+03	2233
16	1.68E+07	168	8.96E+02	FROSTPOINT	16	5.40E+06	168	3.65E+03	2538
18	1.36E+07	188	9.72E+02	2843	18	5.33E+06	188	8.87E+03	2843
20	5.13E+06	208	1.07E+03	TAS (M/S)	20	1.57E+06	208	1.07E+04	3149
22	5.77E+06	228	0.	115.1	22	2.13E+06	228	7.10E+03	3454
24	4.95E+06	248	6.45E+03		24	1.80E+06	248	0.	3760
26	4.59E+06	268	5.84E+03		26	1.53E+06	268	4.44E+03	4065
28	4.20E+06	288	6.67E+03		28	1.60E+06	288	1.69E+03	4370
30	2.89E+06	308	1.36E+04		30	1.33E+06	308	0.	4676
LWC	7.46E-04	7.82E-04	6.67E-03	TOTALS	LWC	2.89E-04	4.49E-04	4.17E-05	TOTALS
MEQ 0	21	130	332	330	MEQ 0	21	93	191	89

AFML CIRRUS STUDY BY AFGL									
AFML CIRRUS STUDY BY AFGL					AFML CIRRUS STUDY BY AFGL				
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START *191410*					INTERVAL START *191410*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: BULL-ROSE					TYPE: BULL-ROSE				
SIZE (MU)	SCATTER (MU)	CLOUD (MU)	PRECIP (MU)	P (MB)	SIZE (MU)	SCATTER (MU)	CLOUD (MU)	PRECIP (MU)	P (MB)
2	2.75E+09	26	0.	424.9	2	2.23E+09	26	0.	4.00
4	3.75E+07	47	9.99E+02	ALT (KM)	4	5.71E+07	47	3.05E+04	706
6	2.05E+07	57	6.30E+01	6.754	6	1.08E+07	57	0.	1011
8	1.33E+07	97	9.57E+01		8	2.20E+07	97	2.85E+03	1316
10	1.04E+07	108	4.04E+00	TEMP (C)	10	1.88E+07	108	1.91E+03	1622
12	9.70E+06	128	1.43E+00	-28.4	12	1.81E+07	128	8.71E+03	1927
14	6.64E+06	148	1.51E+00	2233	14	9.04E+06	148	3.35E+03	2233
16	8.50E+06	168	8.12E+01	FROSTPOINT	16	1.66E+07	168	8.32E+03	2538
18	5.24E+06	188	0.	2843	18	1.01E+07	188	1.30E+04	2843
20	4.28E+06	208	0.	TAS (M/S)	20	6.66E+06	208	2.16E+04	3149
22	2.46E+06	228	0.	115.6	22	4.40E+06	228	3.58E+03	3454
24	2.13E+06	248	0.		24	4.10E+06	248	1.20E+04	3760
26	2.13E+06	268	2.95E+03		26	4.54E+06	268	1.05E+04	4065
28	2.13E+06	288	5.05E+03		28	3.80E+06	288	6.92E+03	4370
30	1.59E+06	308	1.97E+03		30	3.56E+06	308	4.03E+03	4676
LWC	3.85E-04	2.11E-04	4.14E-03	TOTALS	LWC	6.81E-04	1.03E-03	2.69E-03	TOTALS
MEQ 0	21	127	384	383	MEQ 0	27	111	276	290

AD-A063 807

AIR FORCE GEOPHYSICS LAB HANSCOM AFB MASS  
CIRRUS PARTICLE DISTRIBUTION STUDY, PART 2.(U)  
OCT 78 D J VARLEY, D M BROOKS  
AFGL-TR-78-0248

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AFML CIRRHUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 1942100						INTERVAL START 1942100					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.59E+09	26	0.	1.34E+03	442.1	2	3.08E+09	26	0.	3.99E+02	452.5
4	5.73E+07	47	3.22E+04	706	6.470	4	2.44E+07	47	1.04E+04	706	6.300
6	2.44E+07	57	1.01E+04	1011	6.470	6	8.33E+06	57	4.90E+03	1011	6.300
8	2.02E+07	37	9.02E+03	1316	6.470	8	0.99E+06	57	0.	1316	6.300
10	1.82E+07	108	2.04E+03	1622	TEMP (C)	10	5.83E+06	108	1.98E+03	1622	TEMP (C)
12	1.74E+07	128	3.02E+03	1927	-22.9	12	5.84E+06	128	0.	1927	-22.9
14	1.05E+07	144	0.	2833	0.	14	4.17E+06	144	0.	2833	0.
16	1.11E+07	159	0.	2538	0.	16	5.02E+06	159	2.55E+03	2538	0.
18	9.69E+06	199	2.12E+02	2843	0.	18	3.06E+06	199	0.	2843	0.
20	3.70E+06	279	2.31E+03	3149	0.	20	1.12E+06	279	0.	3149	0.
22	2.00E+06	239	3.80E+03	3454	0.	22	1.59E+06	239	2.47E+03	3454	0.
24	3.43E+06	259	1.41E+03	3760	0.	24	1.11E+06	259	0.	3760	0.
26	3.65E+06	271	4.77E+03	4065	0.	26	1.11E+06	271	1.54E+03	4065	0.
28	2.84E+06	291	5.46E+03	4370	0.	28	0.56E+06	291	1.76E+03	4370	0.
30	3.14E+06	311	2.12E+03	4676	0.	30	1.11E+06	311	0.	4676	0.
LWC	5.54E-04		4.04E-04		TOTALS	LWC	2.15E-04		1.20E-04		TOTALS
MEAN	22		120	304	4.50E-03	MEAN	13		116		327
					300						326

AFML CIRRHUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING					
INTERVAL START 1942100						INTERVAL START 1942100					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: BULL-ROSE						TYPE: BULL-ROSE					
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	2.49E+09	26	0.	9.19E+02	447.6	2	2.24E+09	26	0.	1.43E+03	457.2
4	4.56E+07	47	4.29E+04	2.48E+02	6.379	4	4.56E+07	47	3.12E+04	706	6.227
6	2.54E+07	57	1.01E+04	2.91E+01	6.379	6	3.55E+07	57	0.	1011	6.227
8	2.53E+07	37	1.80E+04	2.72E+00	TEMP (C)	8	2.41E+07	37	2.91E+03	1316	TEMP (C)
10	1.25E+07	108	2.05E+03	1622	-22.6	10	2.10E+07	108	0.	1622	-22.6
12	1.45E+07	128	1.51E+03	1927	0.	12	1.47E+07	128	4.39E+03	1927	0.
14	8.27E+06	144	1.59E+03	2233	0.	14	7.20E+06	144	4.61E+03	2233	0.
16	1.31E+07	159	1.95E+03	2538	0.	16	1.08E+07	159	1.90E+03	2538	0.
18	1.06E+07	189	2.12E+03	2843	0.	18	9.14E+06	189	3.08E+03	2843	0.
20	3.97E+06	209	1.11E+03	3149	0.	20	7.68E+06	209	1.12E+03	3149	0.
22	3.42E+06	230	2.55E+03	3454	0.	22	6.09E+06	230	0.	3454	0.
24	1.14E+06	259	4.75E+03	3760	0.	24	5.53E+06	259	1.37E+03	3760	0.
26	4.29E+06	271	4.78E+03	4065	0.	26	4.15E+06	271	1.53E+03	4065	0.
28	2.86E+06	291	7.28E+03	4370	0.	28	4.58E+06	291	3.52E+03	4370	0.
30	1.72E+06	311	6.36E+03	4676	0.	30	5.82E+06	311	2.04E+03	4676	0.
LWC	5.09E-04		6.11E-04		TOTALS	LWC	7.80E-04		2.66E-04		TOTALS
MEAN	20		124	291	2.58E-03	MEAN	24		123		323
					284						322



AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START 19445410*						INTERVAL START 19445410*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	2.93E+09	26	3.97E+04	5.01E+02	461.8	2	3.00E+09	26	0.	2.34E+02	444.5	
4	2.93E+07	57	0.	1.63E+02	ALT (MM)	4	1.04E+07	57	1.03E+04	706	1.07E+02	ALT (MM)
6	1.50E+07	57	0.	3.17E+01	6.154	6	9.50E+06	57	0.	1011	2.76E+01	5.957
8	1.29E+07	57	0.	2.00E+00	TEMP (C)	8	4.13E+06	57	2.06E+03	1216	1.37E+00	TEMP (C)
10	1.03E+07	104	0.	1622	-21.4	10	2.75E+06	104	1.97E+03	1622	0.	-20.3
12	4.73E+06	128	0.	1927	0.	12	3.37E+06	128	2.91E+03	1927	0.	0.
14	4.73E+06	144	2.32E+03	2233	0.	14	1.65E+06	144	0.	2233	0.	0.
16	5.28E+06	169	3.87E+03	2538	0.	16	1.30E+06	169	9.42E+02	2538	0.	0.
18	5.28E+06	189	5.14E+03	2843	0.	18	2.02E+06	199	1.02E+03	2843	0.	0.
20	3.72E+06	203	3.77E+03	3149	0.	20	2.20E+06	209	2.22E+03	3149	0.	0.
22	3.74E+06	230	2.46E+03	3454	0.	22	1.65E+06	270	0.	3454	0.	0.
24	8.35E+05	259	1.37E+03	3760	0.	24	9.31E+05	290	1.35E+03	3760	0.	0.
26	1.67E+06	271	3.09E+03	4065	0.	26	0.	271	3.04E+03	4065	0.	0.
28	8.75E+05	291	3.53E+03	4370	0.	28	1.36E+06	291	0.	4370	0.	0.
30	5.57E+05	311	2.06E+03	4676	0.	30	0.	311	0.	4676	0.	0.
LWC	2.66E-04	19	3.31E-04	1.71E-03	315	LWC	1.41E-04	19	1.74E-04	110	1.51E-03	1.56E-03
MED D			118		304	MED D				326		322
TOTALS						TOTALS						
AFML CIRRUS STUDY BY AFGL												
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						
INTERVAL START 19445410*						INTERVAL START 19445410*						
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)						
TYPE: BULL-ROSE						TYPE: BULL-ROSE						
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	
2	2.83E+09	26	0.	2.60E+02	466.9	2	2.65E+09	26	0.	2.36E+02	444.5	
4	1.87E+09	57	0.	6.79E+01	ALT (MM)	4	2.09E+07	49	0.	743	4.27E+02	ALT (MM)
6	8.50E+08	57	0.	1.26E+00	6.043	6	1.19E+07	72	0.	1086	2.18E+02	5.910
8	1.89E+08	57	0.	0.	TEMP (C)	8	9.37E+06	95	0.	1473	1.67E+01	TEMP (C)
10	2.49E+07	104	0.	1622	-20.9	10	9.37E+06	118	9.38E+03	1773	6.19E-01	TEMP (C)
12	3.70E+06	128	0.	1927	0.	12	4.13E+06	141	2.95E+03	2123	0.	-19.9
14	5.51E+06	144	1.16E+03	2233	0.	14	3.86E+06	154	1.01E+03	2468	7.35E-01	FROSTPOINT
16	1.54E+06	169	0.	2538	0.	16	5.51E+06	187	0.	2013	0.	0.
18	1.10E+06	199	1.01E+03	2843	0.	18	3.03E+06	210	2.04E+03	3150	0.	0.
20	1.11E+06	203	3.76E+03	3149	0.	20	2.76E+06	244	2.22E+03	3503	0.	0.
22	5.54E+05	230	1.21E+03	3454	0.	22	1.65E+06	256	1.23E+03	3888	0.	0.
24	2.78E+05	259	0.	3760	0.	24	1.69E+06	279	0.	4193	0.	0.
26	8.30E+05	271	1.54E+03	4065	0.	26	2.44E+06	302	1.36E+03	4538	0.	0.
28	1.10E+06	291	0.	4370	0.	28	5.51E+05	325	0.	4883	0.	0.
30	0.	311	2.02E+03	4676	0.	30	2.76E+05	348	0.	5228	0.	0.
LWC	5.64E-04	5	1.35E-04	5.64E-04	266	LWC	2.36E-04	20	1.64E-04	90	5.92E-03	6.82E-03
MED D			119		299	MED D				309		301
TOTALS						TOTALS						



AFGL CIRRUS STUDY 9Y AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 1949110*					INTERVAL START 1949110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: SMALL SNOW					TYPE: SMALL SNOW				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.21E+09	26	3.72E+04	1.99E+03	501.2	2	9.54E+08	76	0.
4	9.86E+07	49	1.96E+04	2.89E+03	ALT (KM)	4	1.10E+08	69	2.66E+04
6	8.02E+07	72	9.23E+03	8.01E+02	5.554	6	9.58E+07	72	2.27E+04
8	6.38E+07	95	8.23E+03	8.07E+01		8	8.08E+07	95	1.60E+04
10	4.30E+07	118	9.34E+03	1.35E+01	TEMP (C)	10	5.87E+07	118	1.27E+04
12	4.29E+07	141	1.39E+04	5.72E+00	-16.7	12	4.99E+07	141	1.61E+04
14	2.59E+07	164	1.09E+04	2.44E+00		14	3.70E+07	164	1.06E+04
16	3.49E+07	187	6.30E+03	0.	FROSTPOINT	16	3.79E+07	187	6.71E+03
18	2.75E+07	210	1.45E+04	3158 0.		18	2.56E+07	210	7.54E+03
20	1.30E+07	233	4.29E+03	3503 0.		20	1.52E+07	233	9.75E+03
22	1.54E+07	256	6.98E+03	3848 0.	TAS (M/S)	22	1.52E+07	256	2.27E+03
24	1.27E+07	279	1.20E+03	4193 0.	101.9	24	1.59E+07	279	6.29E+03
26	1.01E+07	302	2.91E+03	4538 0.		26	1.46E+07	302	0.
28	7.69E+06	325	0.	4883 0.		28	1.42E+07	325	0.
30	9.42E+06	348	1.95E+03	5228 0.	TOTALS	30	1.10E+07	348	1.87E+03
LWC	1.44E-03	22	1.37E-03	2.83E-02	328	LWC	2.41E-03	23	1.37E-03
MEQ D			121	332		MEQ D		122	366
TOTALS						TOTALS			
3095.0						3095.0			

AFGL CIRRUS STUDY 9Y AFGL									
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING				
INTERVAL START 1949110*					INTERVAL START 1949110*				
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)				
TYPE: SMALL SNOW					TYPE: SMALL SNOW				
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.15E+09	26	0.	1.54E+03	509.0	2	9.42E+08	76	0.
4	9.86E+07	49	9.72E+03	2.59E+03	ALT (KM)	4	1.13E+08	69	3.70E+04
6	8.02E+07	72	0.	1.11E+03	5.407	6	1.03E+08	72	8.87E+03
8	7.37E+07	95	1.09E+04	2.59E+02		8	7.00E+07	95	5.34E+03
10	4.20E+07	118	1.45E+04	3.86E+01	TEMP (C)	10	6.37E+07	118	1.27E+04
12	4.29E+07	141	1.37E+04	9.69E+00	-16.4	12	4.97E+07	141	1.67E+04
14	2.01E+07	164	8.61E+03	2.94E+00		14	3.74E+07	164	9.45E+03
16	3.53E+07	187	2.85E+03	0.	FROSTPOINT	16	3.74E+07	187	6.71E+03
18	2.22E+07	210	7.67E+03	3158 0.		18	3.77E+07	210	7.53E+03
20	1.93E+07	233	1.09E+03	3503 0.		20	1.94E+07	233	6.13E+03
22	1.31E+07	256	3.82E+03	3848 0.	TAS (M/S)	22	1.94E+07	256	9.01E+03
24	1.17E+07	279	3.82E+03	4193 0.	103.4	24	1.00E+07	279	3.72E+03
26	1.02E+07	302	2.85E+03	4538 0.		26	1.14E+07	302	4.22E+03
28	9.35E+06	325	4.90E+03	4883 0.		28	1.14E+07	325	6.02E+03
30	7.60E+06	348	1.90E+03	5228 0.	TOTALS	30	1.14E+07	348	5.68E+03
LWC	1.42E-03	22	1.45E-03	3.32E-02	361	LWC	2.03E-03	22	2.22E-03
MEQ D			140	361		MEQ D		149	391
TOTALS						TOTALS			
3.93E-02						3.93E-02			



AFGL CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING										
INTERVAL START 191510Z										
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)										
TYPE: SMALL SNOW										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	CLOUD PROBE	P (MB)	
2	7.22E+08	26	0.	798	2.40E+03	520.2	2	1.16E+09	26	1.44E+03
4	1.59E+08	49	5.83E+04	743	3.65E+03	ALT (KM)	4	9.89E+07	49	2.04E+04
6	1.23E+08	72	1.56E+04	1088	1.70E+03	5.180	6	7.25E+07	72	2.87E+04
8	1.17E+08	95	1.36E+04	1433	4.50E+02		8	9.38E+07	95	6.52E+03
10	8.81E+07	118	1.66E+04	1778	1.06E+02	TEMP (C)	10	4.80E+07	118	5.79E+03
12	5.69E+07	141	2.59E+04	2123	4.80E+01	-14.6	12	6.44E+07	141	1.18E+03
14	5.55E+07	164	1.18E+04	2469	2.22E+01		14	3.29E+07	164	6.75E+03
16	6.04E+07	187	1.19E+04	2813	9.74E+00	PRCSTPOINT	16	3.92E+07	187	6.42E+03
18	4.41E+07	210	8.62E+03	3158	0.		18	3.09E+07	210	5.07E+03
20	2.87E+07	233	6.27E+03	3503	0.		20	1.99E+07	233	3.28E+03
22	2.54E+07	256	4.72E+03	3848	0.	TAS (M/S)	22	1.74E+07	256	3.60E+03
24	1.89E+07	279	1.02E+03	4193	0.	103.6	24	1.44E+07	279	2.67E+03
26	2.18E+07	302	2.88E+03	4538	0.		26	1.74E+07	302	3.01E+03
28	1.86E+07	325	3.28E+03	4883	0.		28	1.19E+07	325	4.49E+03
30	1.66E+07	348	7.65E+03	5228	0.		30	1.04E+07	348	2.01E+03
LWC	3.00E-03	27	2.26E-03	137	5.53E-02	TOTALS	LWC	2.06E-03	23	1.18E-02
MED 0					377	576	MED 0			400
										397
AFGL CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING										
INTERVAL START 191510Z										
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MH)										
TYPE: SMALL SNOW										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	CLOUD PROBE	P (MB)	
2	3.78E+08	24	0.	398	2.10E+03	520.1	2	2.21E+09	26	0.
4	2.38E+08	49	6.99E+04	743	4.15E+03	ALT (KM)	4	1.53E+07	49	1.81E+04
6	2.03E+08	72	4.20E+04	1088	3.15E+03	5.195	6	1.65E+07	72	4.76E+03
8	1.79E+08	95	1.11E+04	1433	1.27E+03		8	1.19E+07	95	2.83E+03
10	1.42E+08	118	3.01E+04	1778	4.86E+02	TEMP (C)	10	7.32E+06	118	1.93E+03
12	1.15E+08	141	1.57E+04	2123	1.94E+02	-14.1	12	6.81E+06	141	2.65E+03
14	9.32E+07	164	1.65E+04	2468	8.24E+01		14	5.12E+06	164	0.
16	1.02E+08	187	1.46E+04	2813	3.96E+01	PRCSTPOINT	16	6.71E+06	187	0.
18	8.29E+07	210	1.87E+04	3158	1.89E+01		18	3.57E+06	210	0.
20	5.28E+07	233	1.71E+04	3503	3.71E+00		20	2.75E+06	233	0.
22	4.86E+07	256	4.66E+03	3848	1.93E+00	TAS (M/S)	22	3.36E+06	256	0.
24	4.22E+07	279	6.34E+03	4193	3.29E+00	101.0	24	3.36E+06	279	1.33E+03
26	3.27E+07	302	2.92E+03	4538	0.		26	2.74E+06	302	1.50E+03
28	3.23E+07	325	0.	4883	1.35E+00		28	1.84E+06	325	1.74E+03
30	2.49E+07	348	3.98E+03	5228	1.53E+00		30	1.22E+06	348	2.00E+03
LWC	5.50E-03	23	2.44E-03	123	1.15E-01	TOTALS	LWC	3.53E-04	22	4.03E-04
MED 0					432	430	MED 0			104
										986



AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-01 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 19152100									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MM)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	P (MM)
2	2.63E+09	26	0.	1.62E+01	542.1	2	2.36E+09	26	0.
4	1.22E+06	49	0.	2.68E+01	ALT (MM)	4	0.	49	0.
6	6.07E+05	72	0.	1.17E+01	4.972	6	2.63E+15	72	0.
8	6.09E+05	95	0.	8.50E+00		8	0.	95	0.
10	6.07E+05	118	0.	1.36E+00	TEMP (C)	10	0.	113	0.
12	0.	141	0.	1.44E+00	-12.8	12	0.	141	0.
14	0.	164	0.	2.4E+03		14	0.	154	0.
16	9.11E+05	187	0.	7.69E-01	FRGSTPOINT	16	0.	197	0.
18	6.07E+05	210	0.	3.16E-01		18	0.	210	0.
20	0.	233	0.	0.		20	0.	233	0.
22	0.	256	0.	3848	TAS (M/S)	22	0.	256	0.
24	6.07E+05	279	0.	4193	95.6	24	0.	279	0.
26	6.07E+05	302	0.	4538		26	0.	302	0.
28	0.	325	0.	4883		28	0.	325	0.
30	0.	348	0.	5228		30	0.	348	0.
LWC	5.06E-05	2.51E-05	6.25E-04	TOTALS		LWC	1.94E-05	2.13E-05	TOTALS
MED	16	97	456	6.50E-04	450	MED	2	353	2.13E-05
									363
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 19153100									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MM)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	P (MM)
2	2.63E+09	26	0.	1.62E+01	542.1	2	2.36E+09	26	0.
4	1.22E+06	49	0.	2.68E+01	ALT (MM)	4	0.	49	0.
6	6.07E+05	72	0.	1.17E+01	4.972	6	2.63E+15	72	0.
8	6.09E+05	95	0.	8.50E+00		8	0.	95	0.
10	6.07E+05	118	0.	1.36E+00	TEMP (C)	10	0.	113	0.
12	0.	141	0.	1.44E+00	-12.8	12	0.	141	0.
14	0.	164	0.	2.4E+03		14	0.	154	0.
16	9.11E+05	187	0.	7.69E-01	FRGSTPOINT	16	0.	197	0.
18	6.07E+05	210	0.	3.16E-01		18	0.	210	0.
20	0.	233	0.	0.		20	0.	233	0.
22	0.	256	0.	3848	TAS (M/S)	22	0.	256	0.
24	6.07E+05	279	0.	4193	95.6	24	0.	279	0.
26	6.07E+05	302	0.	4538		26	0.	302	0.
28	0.	325	0.	4883		28	0.	325	0.
30	0.	348	0.	5228		30	0.	348	0.
LWC	5.06E-05	2.51E-05	6.25E-04	TOTALS		LWC	1.94E-05	2.13E-05	TOTALS
MED	16	97	456	6.50E-04	450	MED	2	353	2.13E-05
									363
AFML CIRRUS STUDY BY AFGL									
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING									
INTERVAL START 19153100									
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)									
TYPE: SMALL SNOW									
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MM)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	P (MM)
2	2.63E+09	26	0.	1.62E+01	542.1	2	2.36E+09	26	0.
4	1.22E+06	49	0.	2.68E+01	ALT (MM)	4	0.	49	0.
6	6.07E+05	72	0.	1.17E+01	4.972	6	2.63E+15	72	0.
8	6.09E+05	95	0.	8.50E+00		8	0.	95	0.
10	6.07E+05	118	0.	1.36E+00	TEMP (C)	10	0.	113	0.
12	0.	141	0.	1.44E+00	-12.8	12	0.	141	0.
14	0.	164	0.	2.4E+03		14	0.	154	0.
16	9.11E+05	187	0.	7.69E-01	FRGSTPOINT	16	0.	197	0.
18	6.07E+05	210	0.	3.16E-01		18	0.	210	0.
20	0.	233	0.	0.		20	0.	233	0.
22	0.	256	0.	3848	TAS (M/S)	22	0.	256	0.
24	6.07E+05	279	0.	4193	95.6	24	0.	279	0.
26	6.07E+05	302	0.	4538		26	0.	302	0.
28	0.	325	0.	4883		28	0.	325	0.
30	0.	348	0.	5228		30	0.	348	0.
LWC	5.06E-05	2.51E-05	6.25E-04	TOTALS		LWC	1.94E-05	2.13E-05	TOTALS
MED	16	97	456	6.50E-04	450	MED	2	353	2.13E-05
									363

AFML CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING										
INTERVAL START *191540*										
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)										
TYPE: SMALL SNOW										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.69E+09	26	0.	398	8.12E+00	557.6	2	1.68E+09	26	0.
4	7.51E+05	49	0.	743	9.71E+00	ALT (KM)	4	2.50E+06	49	0.
6	1.02E+06	72	0.	1088	1.56E+00	4.760	6	2.16E+06	72	3.40E+03
8	1.02E+06	95	0.	1433	0.		8	1.71E+06	95	0.
10	5.14E+05	118	0.	1778	0.	TEMP (C)	10	1.08E+06	118	0.
12	0.	141	0.	2123	0.	-11.0	12	4.32E+05	141	1.08E+03
14	0.	164	0.	2468	0.		14	5.62E+05	164	0.
16	5.03E+05	187	0.	2813	0.	FRCPSTPOINT	16	6.48E+05	187	0.
18	0.	210	0.	3158	0.		18	2.17E+05	210	0.
20	0.	233	0.	3503	0.		20	6.06E+05	233	0.
22	0.	256	0.	3848	0.	TAS (M/S)	22	4.32E+05	256	0.
24	2.37E+05	279	0.	4193	0.	122.5	24	0.	279	0.
26	0.	302	0.	4538	0.		26	0.	302	0.
28	0.	325	0.	4883	0.		28	0.	325	0.
30	0.	348	0.	5228	0.		30	0.	348	0.
LWC	2.11E-05	0.	0.	7.71E-05	309	TOTALS	LWC	3.79E-05	1.35E-05	4.00E-04
MEQ D	2	0	0	309	309		MEQ D	12	02	356

AFML CIRRUS STUDY BY AFGL										
FLIGHT E78-03 ON 26 FEB 78 30 SECOND AVERAGING										
INTERVAL START *191540*										
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)										
TYPE: SMALL SNOW										
SIZE (MU)	SCATTER PROBE	SIZE (MU)	CLOUD PROBE	SIZE (MU)	PRECIP PROBE	P (MB)	SIZE (MU)	SCATTER PROBE	SIZE (MU)	PRECIP PROBE
2	1.90E+09	26	0.	398	4.16E+00	564.6	2	1.68E+09	26	0.
4	0.	49	0.	743	4.35E+00	ALT (KM)	4	0.	49	0.
6	8.54E+05	72	1.06E+04	1088	2.29E+00	4.866	6	2.10E+05	72	3.25E+03
8	0.	95	0.	1433	0.		8	0.	95	0.
10	0.	118	0.	1778	0.	TEMP (C)	10	0.	118	0.
12	6.71E+05	141	0.	2123	0.	-10.0	12	2.12E+05	141	0.
14	0.	164	0.	2468	0.		14	0.	164	0.
16	2.28E+05	187	0.	2813	0.	FRCPSTPOINT	16	0.	187	0.
18	2.22E+05	210	0.	3158	0.		18	0.	210	0.
20	0.	233	0.	3503	0.	TAS (M/S)	20	2.12E+05	233	0.
22	0.	256	0.	3848	0.	134.0	22	0.	256	0.
24	0.	279	0.	4193	0.		24	0.	279	0.
26	0.	302	0.	4538	0.		26	0.	302	0.
28	0.	325	0.	4883	0.		28	0.	325	0.
30	2.23E+05	348	0.	5228	0.		30	0.	348	0.
LWC	2.59E-05	1.74E-05	5.24E-05	7.98E-05	346	TOTALS	LWC	1.63E-05	5.32E-06	1.49E-05
MEQ D	2	51	346	307	307		MEQ D	2	91	366

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					
INTERVAL START *191500*						INTERVAL START *191500*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.62E+09	26	0.	1.55E+00	581.6	2	1.40E+09	26	2.51E+04	1.35E+01	645.2
4	2.31E+05	49	0.	743	ALT (KM)	4	2.00E+05	49	0.	0.07E+00	ALT (KM)
6	0.	72	0.	1088	4.442	6	0.	72	9.35E+03	1088	9.06E-01
8	0.	95	0.	1433	TEMP (C)	8	0.	95	0.	1433	0.
10	0.	119	0.	1778	-8.0	10	0.	119	2.53E+03	1778	0.
12	0.	141	0.	2123	0.	12	0.	141	0.	2123	4.75E-01
14	0.	164	0.	2468	0.	14	0.	164	0.	2468	0.
16	0.	187	0.	2813	0.	16	0.	187	0.	2813	0.
18	0.	210	0.	3158	0.	18	0.	210	0.	3158	0.
20	0.	233	0.	3503	0.	20	0.	233	0.	3503	0.
22	0.	256	0.	3848	0.	22	0.	256	0.	3848	0.
24	0.	279	0.	4193	0.	24	0.	279	0.	4193	0.
26	0.	302	0.	4538	0.	26	0.	302	0.	4538	0.
28	0.	325	0.	4883	0.	28	0.	325	0.	4883	0.
30	0.	349	0.	5228	0.	30	0.	349	0.	5228	0.
TOTALS						TOTALS					
LWC	1.36E-05	2	0.	2.08E-06	194	LWC	1.17E-05	2	3.24E-05	9.97E-05	1.32E-04
MED	0	194	0	194	194	MED	0	55	306	270	270

AFML CIRRUS STUDY BY AFGL											
FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING						FLIGHT E78-03 ON 26 FEB 76 30 SECOND AVERAGING					
INTERVAL START *191500*						INTERVAL START *191500*					
PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)						PARTICLE SIZE DISTRIBUTIONS (NUMBER/M**3-MM)					
TYPE: SMALL SNOW						TYPE: SMALL SNOW					
SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)	SIZE (UM)	SCATTER PROBE	SIZE (UM)	CLOUD PROBE	PRECIP PROBE	P (MB)
2	1.45E+09	26	2.57E+04	7.94E+00	607.9	2	1.28E+09	26	0.	1.87E+01	675.2
4	0.	49	0.	1.97E+00	ALT (KM)	4	0.	49	6.61E+03	7.43	5.39E+00
6	0.	72	6.43E+03	1.66E+00	4.105	6	0.	72	2.50E+04	1088	0.12E-01
8	0.	95	1.90E+03	4.36E-01	TEMP (C)	8	0.	95	1.66E+03	1.93	4.29E-01
10	0.	118	0.	1778	-9.1	10	0.	118	0.	1778	0.
12	0.	141	0.	2123	0.	12	0.	141	9.27E+02	2123	0.
14	0.	164	0.	2468	0.	14	0.	164	0.	2468	0.
16	0.	187	0.	2813	0.	16	0.	187	0.	2813	0.
18	0.	210	0.	3158	0.	18	0.	210	0.	3158	0.
20	0.	233	0.	3503	0.	20	0.	233	0.	3503	0.
22	0.	256	0.	3848	0.	22	0.	256	0.	3848	0.
24	0.	279	0.	4193	0.	24	0.	279	0.	4193	0.
26	0.	302	0.	4538	0.	26	0.	302	0.	4538	0.
28	0.	325	0.	4883	0.	28	0.	325	0.	4883	0.
30	0.	349	0.	5228	0.	30	0.	349	0.	5228	0.
TOTALS						TOTALS					
LWC	1.22E-05	1	2.05E-05	4.69E-05	6.74E-05	LWC	1.07E-05	2	5.85E-05	6.91E-05	1.28E-04
MED	0	52	52	303	279	MED	0	52	306	270	163